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Riverside Educational Monographs

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PRESIDENT OF THE UNIVERSITY OF WASHINGTON, SEATTLE

**ESTABLISHING
INDUSTRIAL SCHOOLS**

BY

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PREFACE

THE purpose of this book is to suggest to a State, a city, or to any community some concrete and practical methods of determining what sort of industrial and trade schools it needs, what should be taught in them, and how to select and prepare the instructors who are to do the teaching. It endeavors to be specific, to consider details, and to base its conclusions upon trade conditions as interpreted by the best generally accepted principles of industrial education.

It should not be confounded with any attempt to investigate and report on the educational systems now in existence or with suggestions for the modification of such systems, except as to the addition of trade instruction for men and women who are going to earn a living by a trade.

It seeks to offer suggestions that may be followed by action, that may be used as the basis of actual school establishment rather than as a basis for written report.

The general outline suggested itself to the author some years ago while working in the trade schools of Germany. The present book is sub-

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stantially an expansion of this outline, modified and enlarged by subsequent experience and study.

The writer wishes gratefully to acknowledge the assistance received in short discussions with Dr. David Snedden, of Massachusetts; Mr. Wesley A. O'Leary, of New York; Mr. Charles R. Allen, of Massachusetts; Mr. A. D. Dean and Mr. L. A. Wilson, of Albany, New York; and especially to acknowledge his indebtedness to Mr. Charles A. Prosser, of Minneapolis, for invaluable survey material, and to an address on "The Study of the Industries for the Purpose of Vocational Education," delivered before the National Society for the Promotion of Industrial Education in Grand Rapids, Michigan, by Charles R. Richards, of Cooper Union, New York.

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INTRODUCTION

By C. A. PROSSER

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SITTING in her rose-bower at Belmont, the shrewd Portia said to the winsome Nerissa, "If to do were as easy as to know what were good to do, chapels had been churches and poor men's cottages princes' palaces." It is equally true to say that if to get the proper vocational preparation of youth were as easy as it is to believe that the schools should fit our young people for successful wage-earning, then the task would straightway be accomplished.

It is a rule of life and of service that most of the best things are most difficult to get and to hold. No one debates the benefit which would come to our boys and girls, and to the nation, if they were educated for efficient workmanship in some calling as well as for efficient citizenship. Indeed, we are just beginning to appreciate how much the latter depends upon the former. Yet the task of giving vocational education to meet

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the demands of our complicated modern life is by far the most difficult educational question which the country and its schools have ever faced!

Notwithstanding this fact, the American people, impressed with the great need of a system of education which shall fit for life and service, have, with an enthusiasm worthy of the greatness of their cause, rushed into the task of establishing vocational education faster than we have a knowledge of the facts regarding the wide variety of occupations so characteristic of American life for which our youth must be prepared; faster than we have teachers with proper experience and training; faster than we have gathered experience to guide us in dealing with the problem under American conditions; faster than we have been able to adopt carefully considered and carefully tested equipment, courses of study, and methods of instruction. What wonder that our discussions are academic, our theories conflicting, our wide variety of practice confusing, and our efforts in many quarters doomed to failure!

The way in which this country has gone about getting vocational training is after all characteristic of the way in which we as a people get ahead in everything we do. When a wrong is detected, when a need becomes apparent, when a forward

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step is to be taken along any social, economic, or political line, we rush into the task almost entirely without any previous study and analysis either of the present situation or the remedy to be applied, crying, "Come on, boys, let's do something!"

As a result we usually spend years in ill-considered experiments, conflicting schemes, and wasted effort before we arrive at any meeting of minds on even the principles which are to guide us in dealing with the question. There are no better illustrations of this than the way in which the country has handled the tariff and the liquor questions.

To be sure, our radicalism so characteristic of a democracy has not been the only moving cause of our lack of scientific procedure in dealing with the questions that beset us as a people. The lack of a forward-looking vision leading us to plan carefully for the future has been peculiarly characteristic of a country blinded by a prosperity built upon the exploitation of rich material wealth and optimistic in the face of apparently inexhaustible natural resources. To be where Germany and German efficiency are to-day we should have begun the movement for practical education a quarter of a century ago.

The freedom of thought and of action in a

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democracy brings conflicting ideas and practices that cannot be reconciled save through the acceptance of principles and standards that rest upon the indisputable basis of fact and experience. As a nation made up of forty-eight States the problem of getting concerted action upon vital questions affecting the common welfare, such as the regulation of the liquor traffic and the establishment of vocational education, is that of dealing with forty-eight sovereignties, each having its own peculiar conditions and its own social, political, and educational traditions.

As we grow older as a people, as the disappearance of our boasted natural resources forces upon us the necessity of the conservation of our heritage and of the promotion of the efficiency of our human resources, as our swelling population presses upon our ability to support life, as the simpler give way to more complex economic and social conditions, we shall be forced to study our problems more carefully and to standardize our methods of dealing with them. Then we shall substitute conservation for radicalism, caution for sentiment, investigation for cheap enthusiasm, standards for opinions, facts for guesswork, scientific procedure for ill-considered experiments, and the expert for the demagogue.

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Indeed, the country is already making promising beginnings in the application of scientific methods of procedure to public as well as private questions. The cost accountant and the scientific management expert are abroad in the land. May their tribe increase! Great national problems are being taken from the hands of Congress and committed to expert commissions for study and recommendation. States have been even more active than the Nation in this reform. Bureaus of municipal research or their equivalent have arisen in almost all of the larger cities of the country to safeguard the taxpayer, not only against the dishonest use of money, but through wise city planning against its foolish use as well. Social workers and the statisticians in increasing numbers are seeking the causes of human misery and crime and an adequate remedy for them. The demand for properly equipped people to make scientific studies of our social and economic and political questions is so great that the departments of sociology, economics, and business administration in our leading universities are being forced to make their work more practical and vital in order to prepare a growing number of young people for this service.

The schools of the country have caught the

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same spirit. In the regular schools the desire for greater efficiency in courses of study and methods of instruction has already led to a great many studies or surveys, which have both measured the work of the schools as they are and have made recommendations for their betterment. Equally, if not more, significant have been the surveys for vocational education that have been carried on in the last three years. While vocational training in schools of less than college grade is, after all, only an infant in swaddling clothes, the effort to get it on a more scientific basis is well under way.

The movement for vocational education, which is only about ten years old in the United States, met, as do all such innovations and radical departures from old ideas and old ways, with strong opposition in many quarters. Consequently it went through almost a decade of agitation and propaganda in order to get a foothold with schoolmen and laymen. That propaganda did its work perhaps all too well. No movement in education has ever taken hold of the imagination of any people as has the campaign here for an education fitting for a wage-earning career, unless it be Fichte's call upon the German States for a system of education adapted to the genius

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of the German people. In fact, vocational education is not only well afoot with us, but mounted on horseback. In the absence of the vital facts about the vocations, carefully planned experience to guide and properly equipped teachers to instruct, the movement has been in some danger of falling of its own weight.

The period of agitation is over and the time for constructive work is already upon us. Personally I should have preferred to see National Aid for Vocational Schools adopted five years from now. But since it was certain that a federal bill making appropriations for the States was certain to pass in some form, it becomes the duty of those closely associated with the work to secure the passage of a bill which will provide for adequate national and state boards of control, secure the gradual adoption of standards, and safeguard the proper expenditure of the moneys allotted to the States. With money going to the States to stimulate them in undertaking on a large scale training in agriculture, industry, and home economics, the need for a careful and progressive study of what shall be done in vocational training and how it shall be done becomes acute!

The need for information concerning the voca-

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tions, particularly the occupations in the trades and industries, in order to plan systems of vocational training for the schools, has led to a number of surveys. The first of these was the study made by the Massachusetts Commission on Industrial Education in 1906, which was followed by similar investigations by state boards and commissions, notably that of the Wisconsin Commission on Industrial Education, and that of the Indiana Commission on Industrial and Agricultural Education. The purpose of these investigations was largely to find the need for vocational education in these lines and to consider the broad administrative policies upon which through legislation the plan adopted should be based.

Within the last two years large cities having the resources to meet the cost of thorough studies have carried on surveys under the direction of persons of experience, to gain the facts which would help them to get the kind of industrial or commercial or household-arts education, particularly the former, best adapted to their conditions and needs. Among these have been the studies made by the Richmond Survey, the Cleveland Survey, and the Minneapolis Survey. The first and last of these were conducted by the

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National Society for the Promotion of Industrial Education as one of its means of serving the cause in a constructive way. The Society is now coöperating with the Indiana State Board of Education, and various local school boards in Indiana cities and counties, in the making of a survey for vocational education in various types of communities in that State; while the United States Bureau of Education is investigating the situation with regard to vocational education in connection with an educational survey it is conducting in the city of San Francisco.

These surveys are predicated on the idea that they are not only a good business proposition, but that the facts they gather and the expert opinion they offer are necessary to any intelligent dealing with the many difficult problems to be met in establishing vocational education of any kind in the community.

When a patient approaches a physician for treatment, the first step taken by the latter is to make a diagnosis of the situation before he offers a remedy. American communities, with all their justifiable pride in the many good things about the public-school systems, realize that it is ailing, is deficient in provisions for preparing boys and girls to meet the requirements for successful wage-

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earning and the highest success in modern industrial and commercial life. The survey makes a diagnosis of the situation and suggests a remedy in the form of a plan or scheme to meet it.

No competent American business man would think of establishing a manufacturing concern in a new place without making a survey — a careful study of all the important features of the location of the proposed enterprise. He would want to know, for example, the location of the site with reference to a source for raw material, competent labor, and desirable markets. He would look into the physical conditions of the site, its slope, drainage, and composition. The switching facilities for moving fuel, supplies, and finished product would be carefully investigated. Perhaps most important of all, his decision as to locating his business would depend largely upon the desirability of the community as a place to live and rear his family.

So in the same way a survey for vocational education is a wise business proposition. The community is soon to be called upon to invest money in site, plant, equipment, salaries, and supplies for the purpose of changing raw material in the form of untrained youths into the finished product of young men and young women

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equipped with the knowledge and skill to become successful wage-earners in their chosen callings. In order that neither the money of the city nor the time of its young people may be wasted, the vital facts about its vocations and its vocational needs should be gathered and interpreted by competent people before the school is begun. If there is any field of education or of human service where the old adage, "Look before you leap," applies with more force than in the establishing of vocational schools, the writer does not know what it is.

Every community, before entering upon a program of vocational education, should make a preliminary study of the conditions to which its plan must be adapted. It may be possible for communities to borrow or copy their school organization and their courses of study for general education from other places, although this usually results disastrously. One of the most pitiable spectacles in education to-day is the rural community which has borrowed every feature of its work from that of a near-by city. Its manual training has no relation to country life. Its courses of study give no help to the worker in agriculture and lead away from rather than to the farm. All its work is aimed, not to

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prepare country boys and girls for rural life, but to prepare an occasional and lonely graduate to meet the entrance requirements of the state university.

In vocational education a community cannot transport bodily any scheme from another place, however well it may seem to meet the needs of the latter. Industries differ in kind from one community to another. When of the same kind they differ in grade and therefore in their demands upon workers. They differ in such things as the entrance wage they offer, the health risk to be met, and the opportunities for better wage and promotion presented. They differ in the attitude of employers and their willingness to coöperate with the school by employing its graduates on favorable terms or in employing boys on a part-school, part-shop plan. Likewise communities differ in the attitude of organized labor toward the school and toward recognition of the training given by the school as a part of the required apprentice training. Communities vary from State to State in the age and the conditions under which a pupil may leave school to go to work.

Even if communities could safely copy their scheme of vocational education bodily after that

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of another city, they would not get very far. Thus far industrial education for the youth has been established for a very few trades, such as machine shop, carpentry, cabinet-making, printing, electrical work, automobile repair and construction, bricklaying, plumbing, and gas-engine work, in the case of boys; and dressmaking, millinery, cooking, machine operating, and junior nursing, in the case of girls. These fourteen lines are, after all, only "a drop in the bucket" when one considers that the last United States Census listed three hundred and eighty-six recognized occupations in the industrial and mechanical industries alone.

Not all occupations are worth training for, it is true. Nor can the school train successfully for all occupations, some of which must be learned "under the conditions of the trade." But it seems clear that thus far we have only crossed the threshold of our task of providing training for the vocations in industrial and mechanical lines. Vocations are to-day highly specialized, and any training for them, to be successful, must be correspondingly highly specialized. The search for common elements in all the vocations, which could be given to the youth as a preparation for each and all of them, has been from the outset

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as certain of failure under modern conditions as the search of Ponce De Leon for the magical fountain of youth.

Without precedent to guide them, upon which they may completely rely in meeting the difficult and complicated and highly specialized problem of providing vocational education for its citizenship, communities must base their programs on a local study of conditions and the suggestions and recommendations of those with most experience in dealing with vocational education.

Not all communities can or will provide surveys carried on by outside parties. In such cases the study if made must be conducted by the superintendent of schools or some other local person. Even if communities desired a survey by so-called "experts," there are few persons at the present time with experience sufficient to equip them for the task. Communities are not accustomed to pay for such investigations out of their school budget. It may be that in some States such an expenditure from the school fund is not authorized by law. Too often local self-sufficiency opposes outside interference. In many quarters of every community there is an impatience if not contempt for expert service. While the

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money which a community would spend for a competent survey before undertaking any plan of vocational education would probably be the wisest investment it could make, communities do not always have, or at least they do not think they have, the money for such an innovation.

For all these reasons, and for others that need not be given here, we may expect to see the survey, conducted by persons of experience brought in from the outside, confined, in general, to the larger cities where philanthropy or an awakened public sentiment has made the establishment of vocational education on an extensive scale possible and imminent, and where the call for an expert study is insistent.

Most of the surveys for vocational education, particularly outside the largest cities of the country, will be conducted by local agencies of which in many if not in most instances the superintendent of schools will be the leader. It is for his benefit, and for that of others like him who want to know how to carry on an investigation of the questions germane to the proper establishment of vocational training in a given community, and how to translate the facts when gathered into a policy and a program of action, that Mr. Smith's monograph has been written; and to

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all such his contribution will render the largest service.

While the greater part of this little book is devoted to the problems of the survey for vocational education, the author has, with commendable foresight, included in addition a closing section rich in the information and suggestions it gives as to the steps to be taken and the best ways of getting, as the result of his survey, such things as a proper course of study, advisory committees, and trade agreements. The monograph is really a primer full of valuable analysis, illustration, statement of sound principles, and wise suggestions for the student of the subject or the administrator facing the new and difficult problem of getting the right kind of vocational education started in his community.

Especially to be commended is the first section, where in a colloquial style the author has set forth, with keen analysis and simple language, the educational and social principles which in his opinion should be observed in any publicly supported scheme of vocational education, and the questions that need to be answered by a survey of any given industry before the schools can determine either whether they should train for the industry or how they should train for it.

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Whether or not we agree with Mr. Smith altogether in his statement of principles, we cannot be other than grateful to him for the force of his presentation and for the rich knowledge of vocational problems which his keen analysis shows.

Mr. Smith presents the case for a program rather than a portrait survey. The latter is a study which contents itself with furnishing a picture of the situation, largely statistical in character, for a community where there is no definite prospect of the immediate establishment of schools. The former is a study which focuses upon a definite plan of action in a community wanting to establish vocational schools at an early date. It has been aptly said that the portrait survey is best represented by a girl and an adding machine, while the program survey is best typified by a conference.

Probably both have their place in the movement to get vocational education. The portrait survey is doubtless the slow but sure educator and moulder of public thought as the foundation of careful, intelligent action at some time in the future. The program survey is the constructive agent which gathers from the trades, industries, and occupations, not only the pertinent facts but the attitudes, the coöperations,

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and the help of all interests necessary to start vocational education aright in a community where intelligent public opinion is ready for the step and resources are available to finance the undertaking.

There is a strong temptation in the making of any survey to lay perhaps too much emphasis on the literary and statistical side of the work and to shape the study with the hope that it may become a permanent contribution to the literature of the subject. Personally, the writer feels that the thing most needed and the thing from which communities will in most cases get the largest return is the survey which has its aim fastened upon the immediate usefulness of the study to the city it serves. From this point of view, not only must facts be gathered and interpreted and recommendations made, but conferences must be held, coöperations established, trade understandings proposed and perfected, and the whole community brought into an enthusiastic and working support of the plan adopted. This is the point of view and spirit of Mr. Smith's contribution.

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I

SELECTING THE SCHOOL

OUR PRESENT FOOTING

SOME years ago two gentlemen were traveling through a sparsely settled section of Western country and one of them asked a native how far it was to the next town. "About two hours' traveling," said the native, and turned again to his work. After journeying for another hour toward the town, they met another native and again asked the distance to the nearest settlement. "About two hours' traveling" was the answer. Two hours more the two friends kept on their way, and for the third time inquired of a native the distance to the next town. "About two hours' traveling" came the answer. "Well," said one of the gentlemen to the other, "I'm mighty glad we are holding our own."

The industrial educator has many reasons for being "mighty glad we are holding our own."

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So swiftly has educational thought progressed along practical lines and so decidedly have the manufacturer, the trade unionist, and the trade worker changed their views on the subject of trade training in schools, that the industrial teacher has had to move rapidly if he did nothing more than keep up. It must be confessed, too, that we have not done much more than "hold our own"; and we ourselves are somewhat to blame for this.

We have been doing a great deal of thinking along the line of practical trade-school education in the United States, but we have not always thought to the point. We have philosophized, theorized, and speculated too much, perhaps, to accomplish large material results. This is not to say that we have not progressed. There must always be this period of theory and speculation and we are almost through it. In more than one State now we are beginning to find the real trade school.

Need for facts

The time has come when we must follow our thinking with action. We must study trade education as a concrete and business problem as well as an educational problem in order to know what

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to do to insure success. We must study each phase of the problem in order to ascertain whether that phase can show us that education for its particular business is or is not needed; if needed, just what is needed, by whom it is needed, and from whom it may best be obtained. What the country needs now are facts, and facts are always obtainable if you go about it right. Whenever the people of any State are ready to attack this problem in real earnest, they will soon find themselves developing an educational philosophy and program sufficient to assimilate, interpret, and act upon all the facts presented.

With this point of view, then, let us turn to our first concrete study.

Study the industries

Industrial education depends upon the industries. Every attempt to separate the trade school from a close relationship with the trade has proved disastrous. A study of industrial education from the educational standpoint alone will not do. If we are to prepare men and women to live in an industrial field, we must study closely the industry by which they are to live.

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What industries to study

What industries, then, shall we study? Obviously those which are in the community and a part of the community which is undertaking to establish and pay for the schools. When a careful investigation has convinced a city or village that it has not within its confines the right kinds of industries in sufficient numbers to furnish good employment for all the graduates of its industrial schools, or that it is impossible or unwise for other good reasons to train exclusively for the home trades, it can then turn its attention to the industries of the State and Nation. It must then take care to select trades and occupations that have a steady and general demand throughout the whole country, such as printers, painters, barbers, and salesmen, rather than trades that are found only in selected spots, like miners, millers, glasscutters, and quarrymen. By whatever method we select the industry to be studied, the method of conducting that study will be practically the same.

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WHAT TO STUDY ABOUT AN INDUSTRY

First of all let us determine whether this industry is one that should be encouraged for the good of the community and the State.

The work place

Does it place its workers in clean, ventilated, and healthful rooms, such as those provided by the National Cash Register Company, the Shredded Wheat Biscuit Company, the National Electric Light Company, and many other industries, or in damp, dirty, disease-breeding places like the older textile mills, a large number of the older foundries, oyster-handling cellars, and tobacco-stripping plants?

Hygienic nature of the work

Is there anything about the occupation itself that affects the eyes, nose, lungs, etc., and so, from undeniable data, cuts down the age of its employees? This is the case in glass-blowing and cutting and in metal-polishing, except under the most modern conditions. It is generally true of paint factories, chemical process companies, and always true in drilling and blasting coal mines.

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Moral and social conditions

Is there anything in the nature of the work that is morally degrading or anti-social, or is the community proud that it possesses such an industry and glad to publish the fact at every opportunity? Under the first head would come piano-playing in dance-halls, messenger service to dives and gambling-joints, waiting on table or bar in all-night cafés, and service in billiard- or pool-rooms. Distilleries and breweries, the padrone system and company stores in mining and milling plants would illustrate anti-social conditions not necessarily morally degrading.

Standing of the industry with its workers

It is often enlightening to know how an industry appeals to the men who are employed in it. Is there a rather permanent list on the payroll, as in railroad work, jewelry-making, cut-glass industries, and the finer grade of steel mills, or is it continually shifting? What percentage of the men drift out of the trade or shop in three, six, or nine months? There is a constant shifting of personnel in the millinery and barber trades; but it represents for the most part a change of location only and not an attitude of indifference

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to the trade. On the other hand, the simpler processes in shoe factories and textile plants are very largely performed by a transient class of workers, and the canning factories are notorious for having a completely new set of hands every season. Such work cannot hold a very high place in the estimation of these workers.

The wage factor

What percentage of the total number of employees is hired each year? What is the average wage of a beginner without experience in any trade; of a beginner with experience in some mechanical line?

Local standing

Are the men in this industry considered a civic and economic asset by their fellow townsmen? To work for the Gould Pump Works is to have a standing in Seneca Falls; the same is true of a place on the pay-rolls of La France Engine Company, in Elmira; likewise to hold a skilled position with the Maydole Hammer Company, the L. S. Starrett Company, and the Stanley Rule and Level Company is to have a national standing as a craftsman.

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Interpreting the above

The State or community that proposes to put its stamp of approval upon the training for an industry and to contribute financially to such training must determine at the start that the answers to the above questions are favorable to the progress of the community as an economic and civic unit and favorable to the young men and women whose careers the community is proposing to shape. If the answers to these questions are unfavorable, the community should publish the fact and refuse to establish a school or class preparing for such employment.

CHILD-EMPLOYING INDUSTRIES

While the foregoing facts are most important from a general standpoint, it must not be forgotten that industrial education is primarily for the children of industry, if we may designate as "children" all minors up to twenty-one years of age. We must therefore study especially the child-employing industries.

What are they?

What are the child-employing industries of your State? Are they healthful and stimulating both physically and mentally? If it was impor-

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tant to know this about industry in general, it is many times more important to inform ourselves regarding it in these cases where children are to enter the industry at early ages. Whenever the actual investigation shows that an industry is health-breaking and brain-deadening, a community should refuse to train children for that industry.

Children employed — number and age

The next step is to ascertain how many children these industries employ, at what ages these children enter upon employment, and at what age most of them leave.

Are numbers excessive?

In this connection it is important to note whether the children are being exploited to such an extent that the numbers actually employed are in excess of what naturally might be expected in such a community. In many States the compulsory education laws prevent this state of affairs, but in the Southern textile mills and tobacco plants young children are employed in excessively large numbers. Even in States having stringent factory laws, dolls, willow plumes, and artificial flowers are made in the homes by such

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numbers of little children that the percentage of minors employed in gainful occupations is much too high. Even when the industry may be found healthful and not excessively monotonous and deadening, it may be drawing children in such numbers and at such early ages that the efforts of the community should be exerted to check rather than increase the number of children going to work.

In this case a compulsory education law may be of more value to a locality than a trade school. Here again a trade school for apprentices after they have entered the trade would be better than one of lower-grade work having a tendency to lead pupils into the industry. A trade school not connected with apprenticeship should not be established in this case unless it could be of such rank as materially to increase the intelligence of the beginner, raise the age of entrance to the trade, and so cut down the influx of young children into that industry.

The age problem

This will necessitate a study of the age problem from three sides — the actual average age at which the children are now entering, the age at which the employer prefers to have them enter

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and his reasons for the same, and the age at which a child, from the standpoint of the community, should enter. Here again we may refer to the Southern textile mills and tobacco-stripping plants and to bell-boys and chore-boys for hotels and boarding-houses. The employers hire the youngest children available for the work because they will accept the smallest pay; in actual fact the children now in these Southern plants are below the ages allowed by our most sensible compulsory education laws; the community has been shown to suffer physically, mentally, and morally for its neglect of these future fathers and mothers.

If the average entering age is so low that it endangers the welfare of the community's children and if the employer prefers to have beginners at these early ages because of low wages, as in these Southern mills, action should be taken to prohibit this: and most certainly no community would be justified in establishing a school training these children for such industries. If the entering age is too low because the employer cannot obtain sufficient help without these young children, or if they are put to work by their parents for real or fancied financial reasons, let us know whether the employer will agree to

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hire more mature beginners at a higher beginning wage if they have had special training for his work. Would not their increased efficiency enable him to get along without the younger children? Would not the increased earning capacity of those at work make it possible for the family to keep the others a longer period in school? If it can be shown that older children should be employed and would be employed at proper wages if they were available, a trade school may be planned to train these children after they have reached a specified age, and thus increase the age of entrance and the earning capacity.

Length of employment

We must know also the average age at which children leave their employment, to see whether it is worth while to prepare them at all. It would be foolish to prepare children to enter an industry where between the average age of entrance and exit there was only a difference of three months, unless it can be shown that the short period of service is due largely to the inability of beginners to profit by the possibilities opened to them. In one of the larger shoe factories in central New York there is a constant change in the

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men employed in the cutting department; this constant changing, we have already seen, is true of the workers in our canning factories and of those in knitting mills and mills producing low-grade cotton textiles. Similar instability is found among the workers on the simpler processes in the making of harvesting machinery, and in one instance a foundry employing three thousand men reported twenty-six hundred yearly changes. Where men and women are continually shifting from one line of employment to another, the community cannot afford to finance their vocational training until a study of the trade shall reveal that there are skilled processes requiring special training which this shifting group has never received and which might be expected to hold them more uniformly in one industry.

In the case of the shoe factory above referred to, there is ample opportunity for advancing these young men to more skillful and lucrative positions, but neither the firm nor its employees have sufficiently recognized this fact. In the canning factories there are no more skillful and lucrative positions for the workers to look forward to, and in the foundry mentioned, the inability of foremen to handle their men was given as an important factor in causing this constant

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shifting. Thus, the short term of service alone cannot condemn an industry; there may be other evidences of a most hopeful nature.

OPPORTUNITY IN THE TRADE

There may be, for instance, every evidence of neglected opportunities. For this reason where it can be shown that a reasonable percentage of children are actually employed and these at ages agreeable to the community's standpoint, the establishment and nature of the school will depend, not only upon the length of service disclosed, but also upon the opportunities offered for advancement. Thus, in the machine trades and in printing, in our Northern woolen mills, and in our electric light plants, the age of entrance upon employment is uniformly high enough to satisfy any community, kept so either by the employers or trade unions or by the nature of the work. In the cases of machine industries and printing, however, the opportunities of advancement through mechanical skill are larger than in the other two cases, because the gradation of work is more uniform and the sequence more definite. We must, therefore, know first that the nature of the work is compatible with a much longer term of service,

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and, secondly, that if we prepare the child for this longer term there will be a constant possibility of advancement. For this purpose let us suppose ourselves considering one great child-employing industry.

Are skilled processes ahead?

Are there skilled processes beyond those elementary ones the children are doing? This is true of all the well-regulated trades offering apprenticeship instruction, such as those of the machinist, carpenter, electrician, and printer. If our investigation of this question shows that the employment is of the "blind-alley" type, in which two or three weeks, or even less, suffices to master all the technical training and skill that can be employed in the work, — which is true of about eighty-five per cent of the paper-box-making industry and of about an equal percentage of the machine work in shirt and collar factories and in laundries, — it is evident that no trade training at public expense should be provided. If the advanced processes of the work are so simple in nature that all the knowledge and skill needed can be picked up in the trade itself with what little assistance can be given by a foreman, which is possible in plants working on

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white goods, in power sewing, straw-hat sewing, and underwear knitting, it is then inadvisable to use public funds for training workers to enter this industry. If the amount of technical information is small and can be learned with little or no instruction and the required skill is of sufficiently low grade to be supplied by the industry itself, either on the shop floor or in shop apprenticeship classes of short-unit type, as in the simpler processes of shoemaking and glove-making and in machine-tending, it is inadvisable to train children for this work in publicly supported schools. It is in industries of this type that the shifting factor is most prominent.

Other training possible

In these cases, where direct trade training is refused, some other form of instruction might be offered, such as general education in evening schools, training for a better occupation, or for a change of occupation in the same plant, which are discussed later on in this book.

Fitting the apprentice for advancement

If it can be shown that there are advanced processes in the industry and that they require skill of high degree and technical information of

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special nature, then it is our business to find out whether the work that is assigned to children is fitting them in any way to advance and master these higher processes and whether they really do so under present conditions. In the case of the well-regulated trades cited above, this might or might not be true, depending upon whether the apprentices were given a series of jobs in rotation or kept on one type or piece of work. At one time the Lehigh Valley Railroad started all its apprentices in a shacking department, which had no direct bearing on their future apprenticeship, and though it may have contributed to their general training, it was the cause of much falling off and shifting on the part of beginners. The Fore River Shipbuilding Company, on the other hand, has had for some years a carefully planned system of apprentice rotation, which not only assures each man a general experience, but supplements a classroom course in the technical side of the work.

It is possible to arrange the apprenticeship work in all high skilled industries so as to provide such successive advancement as just referred to. If it is not provided, it is our business to see that it is provided before the public is taxed to assist in the training of its apprentices.

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We must know whether a beginner is kept on piece work or moved from one operation to another; whether the learner is watched and advanced from one class of work to another according to the ability displayed. The first will be found the case in the large automobile shops, in specialized plants like those producing machine chucks, and generally in furniture factories, sash, door, and blind factories, and plants of that nature. On the other hand, a careful supervision of apprentices is maintained in the American Locomotive Works, the General Electric Company, the Brown and Sharpe Manufacturing Company and in the Filene Stores in Boston. In a pattern shop, where several simple patterns are in constant demand, would a young apprentice be kept six months repeating these patterns because he could do so rapidly and profitably to the firm, or would the foreman observe when he had reached sufficient accuracy and speed on these elementary patterns and then permit him to attempt others involving new processes? Would a girl in a dressmaking shop be kept always on skirts because she had speed at that work, or would she be permitted to learn the setting-in of sleeves, even though it entailed some loss of time at the start? This depends alto-

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gether too much at the present time on the size of the plant. In a small shop employing a few girls, the different branches of the trade may be learned by one girl, but in large establishments it is quite impossible without a change of employer or a very great sacrifice in wages. A graduate of the State College for Teachers at Albany, who had completed a two years' course in dressmaking, entered a local dressmaking establishment in order to acquire commercial experience. She was unable at any time during a year to get any instruction in fitting or even to enter the fitting-room, partly through jealousy of the technique and partly because she was an adept at fine hand-sewing and it was desirable to keep her at that work. There is very little educational or trade profit to a beginner who remains for weeks upon any specialized branch of a trade, and it behooves us at once to investigate the causes that have brought about such a general misuse of the apprenticeship years.

If not advanced, why not?

If the apprentices are kept upon this kind of piece work, is it due to something in the nature of the work or to some attitude on the part of the employer that will prevent a change in this

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method if the beginners are trained; or is it due to the fact that proper training for advancement is not offered in the shop or outside of it? This is one of the most important questions to be determined: it is a mighty stumbling-block in the way of trade education where the answer as to the employer's attitude is unfavorable. In the dressmaking example cited above, the apprentice's difficulties came more largely from the employer's attitude than from any expediency of the shop, although the latter was an important factor. During one of the national meetings of the Society for the Promotion of Industrial Education, a man of wide intelligence, a large employer of labor, and a man of financial standing frankly and publicly placed himself on record as opposed to hiring in his plant any young man who would not be willing to learn the manipulation of one machine, acquire skill and speed in that one partial process, and then remain at that job indefinitely without seeking continually to change around and learn other parts of the work. In a great furniture factory where everything is specialized, this method of production seems indispensable to the employer: as a business proposition alone it cannot seem otherwise to him; but the State is concerned first

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for its citizens, not for mechanical systems, and to begin an apprentice on such work and keep him always on the same work, cannot result otherwise than in a citizenship inferior in capacity, narrow in outlook, and excessive in its effort to find recreative reaction.

Apprentice vs. adult

An adult citizen, broadly trained in his apprenticeship days, capable of a general appreciation of the industry in which he is employed, working not more than nine hours a day, may, without serious injury to himself or his community, be kept on intensive piece work: but a learner cannot grow in such a task.

Employer creates a "blind alley"

The first instance, where the employer refuses to do his part, or for a real or fancied reason maintains that the nature of the work will not permit a change, is similar to the blind-alley employment and should not be supported by the public.

SHALL WE TRAIN INSIDE OR OUTSIDE THE SHOP?

In the second case, where training is possible but not offered, let us determine, first, whether we can provide proper training in both skill and

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technical information inside the shop and do it effectively and economically, or whether it is advisable to provide a school outside the shop to give apprentices instruction in one or both of these lines of work. In other words, assuming that the industry has advanced processes requiring training of special nature, is there a real need for a separate school at public expense to provide this training? If the industry is so organized that it cannot properly give this training within itself and in its regular activities, then it must be given outside the industry or at least outside the regular work of the industry.

Training within the industry

To answer intelligently whether or not an industry made up of both elementary and advanced processes is offering within itself all the opportunities for training that are needed under present conditions, it will be necessary for us to turn again to the collection of facts. Let us know first how many of the children formerly employed in the elementary processes have remained in the industry in advanced positions. What percentage of the total number of employees are considered as holding advanced positions? What is the scale of wages, beginning at

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the bottom and running to the highest paid operators and foremen, and how many men and women employed continuously for ten years are now drawing low wages as against the same class drawing high wages? We must also find out how long these operatives have held their positions without being advanced in their work, whether they have risen through increased skill or through general knowledge of the processes of the industry and how many have not advanced at all.

Large number advanced

If a large number of beginners have advanced to places of importance, this may indicate that the industry is itself affording all the training necessary, that no outside training is required; or it may indicate that a splendid opportunity for supplementary training is being neglected. The question is, How long has it taken them to advance to these better places and how many have failed to succeed? Thus, we find in the case of instrument-makers that the work is very largely dependent upon superior skill, that the business offers every opportunity for acquiring this skill, and that the employees of such firms as Bausch and Lomb, in Rochester, often

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have records of service exceeding thirty years. We find also that these long-term employees mostly hold highly paid positions implying skill or responsibility and that their promotions have been steady and systematic. Whatever might be the advantages of a public trade school to give instruction in the science and theory of optical work, it is practically certain that no such school is needed to train in mechanical skill for the optical work done by this firm.

Large advance but slow

For telegraph operators, railroad freight agents, express messengers, and postal clerks there is a large and very general advancement, and the man who remains long enough usually arrives at a very good position; but the rise is unreasonably slow. These employees, if denied any outside instruction and left dependent upon the daily routine of business, would seldom rise to any distinctive positions, and where they did, would do so after many wasted years of labor. This line of business offers large advancement, but it does not offer within itself all the instruction needed to secure this advancement. Where the rise is assured, but has been slow, where it is due to skill and technical information not fully

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provided in the day's work, we can accelerate it by training given in part-time and evening schools. This training should bear especially upon the points that experience shows are most difficult to acquire in the trade work itself.

Small number highly skilled

Long records of service are still found in some of our American watch factories, but in this case they represent former rather than existing conditions. To-day the majority of the employees working in the watch-making factories are unskilled girls and women who cannot advance to the best-paying positions except through unreasonably long years of service, and even then in but a few instances. This industry at the present time appears to be satisfying its own needs as regards training in skill. This is because the low-skilled operatives either drop out after a few years or content themselves with long years of service at simple operations and comparatively small pay. Training in skill is certainly needed here, but it can undoubtedly be given to sufficient numbers by reorganizing the work of beginners, and a public trade school is a doubtful need, inasmuch as so few employees can be advanced to really highly skilled work.

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Our attention may here be turned to some shorter and less expensive method of publicly supported training for these people. For example, if investigation shows that a very small percentage of those remaining in the industry after ten years are holding places of importance and skill, due to the fact that the upper positions are relatively few in number, or because there is something in the nature of these positions that makes it impossible to rise from the ranks except in extreme cases of genius, a community may feel justified in offering short unit evening courses or day continuation classes to assist the operatives as far as they can be assisted to the small advancement offered. Another example of this is seen in the overall-making industry. The work is not highly skilled, advancement is limited, and where there is one woman holding a position of responsibility there may be several hundred, many just as capable, who cannot advance because no positions are open. Again in the stained-glass industry there are certain processes dependent upon manipulative skill that offer limited advancement to boys and men, but comparatively few can reach the highest-paid positions because they are so largely dependent upon native artistic sense. Compare these

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with the machinists' trade, where the highest-paid work is within the reach of any normally endowed beginner who is assured proper training and is willing to work. In a case like the first one, the short course may be given or it may be possible to fit these employees for some other industry offering better opportunities of advancement. This phase of the question is discussed further along in this chapter.

The foregoing examples assume that, whether promoted to positions of importance or not, the beginners remain in the industry. We shall now consider cases where the industrial mortality plays an important part.

Apprentice mortality

If a large number of beginners leave the industry in a few months, it probably indicates that they are receiving a low wage. This may be due to the fact that they are kept in low-skilled occupations and not permitted to advance, although as a rule this very repetition of process increases the wage, but curtails the prospect of advancement. It may be due to the fact that beginners are being trained for advancement and thus their immediate earning power is less than when no training is given. This latter is true in

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the great railroad systems which conduct schools for apprentice training and of other concerns like the General Electric Company and Fore River Shipbuilding Company.

If a large number of operatives are leaving because no opportunity is offered for advancement, or if a large percentage are remaining, but remaining in low-skilled processes because of higher wages, and if in this industry there are highly skilled places to be filled, then the need of a trade school is evident. Where operatives are leaving to seek better wages and thereby neglecting proffered opportunities of training in the industry itself, it will probably be better to organize a specific class in the shop or factory, give it public support, and publish its opportunities than to organize an outside trade school. This throws the emphasis upon the advantages of that particular trade rather than upon the advantages of the school, which acts somewhat as a means of vocational guidance. In many cases it will be more efficient and more economical than the detached class and it will further place the influence and support of the public behind those employers who are willing to offer proper opportunities for training to their young workers. A community may well give serious

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consideration to any plan that gives promise of holding apprentices to a fixed trade. It is characteristic of American trade beginners to enter several trades one after the other, leaving them all unlearned, to settle at last upon some other trade or business. Occasionally this represents a real effort to find one's place in industry, but usually it is prompted by discontent, craving for change, and lack of foresight, all of which are fostered and encouraged by the lack of a definite and connected course of training which every apprentice must start the day he begins work in a new line or occupation.

The nature of the work

Independent of the fact of whether an industry is or is not now offering within itself the training and instruction needed by young apprentices, the question must arise whether there is anything in the nature of the work that will permit or prohibit its arrangement to provide this training if the employers desire to do so. First, can we provide both skill and technical information? It would be entirely possible to do this in the regular work in the case of furniture-making. The plumbers and the carpenters could give the entire training in skill and theory in

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the course of the daily work if it were necessary to do so, but the advancement of apprentices can be very much accelerated by forming classes out of working hours and giving special training in drawing, blue-print making, arithmetic, and building science.

Can we give skill alone?

Training is readily given so far as skill is concerned in such cases as printing, painting, and paper-hanging. The tinsmith, the boilermaker, and enamel-ware workers can best acquire skill in the regular commercial job. The one indispensable condition is that the instructor shall be a thorough tradesman, familiar with the handling of young men and capable of doing carefully planned and connected teaching. In trades like these it will be far better to offer special outside courses in the technical knowledge needed for advancement.

In some cases even skill cannot be offered entirely in the trade work.

Must skill be given outside?

Thus, the organization of plants for bleaching and dyeing would ordinarily include complete chemical laboratory facilities, in which training

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in all the elementary principles of the chemistry of bleaching and dyeing could be given if desired. On the other hand, the organization of a textile mill would not include adequate facilities for teaching the chemistry of textiles, although it would afford ample opportunity for training the apprentices in the preparation, mixing, and use of dyestuffs as applied to the work of that particular mill. In the first instance it would be foolish to establish a separate school for the instruction in chemistry: in the second instance, with few exceptions, it would be necessary to provide a separate laboratory for instruction in textile chemistry. Lastly, such an industry as the Solvay Process Company, near Syracuse, New York, has found it practically impossible to give satisfactory training to its apprentices while they are engaged in their regular work, and has for some years conducted a separate school to aid in their instruction.

Is general knowledge required?

In many cases neither skill nor technical knowledge plays the most important part in determining the advancement of employees. General trade knowledge, at best not more than semi-technical, is often required for responsible positions.

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If advancement is due to a general knowledge of the industry, which is true wherever the business is a distributing agency rather than a producing agency, or a combination of both, such as the Fairbanks Company, we can certainly hasten it by teaching the theory in special classes for that purpose and organizing a course in the actual practice, to be given in the shop or factory or salesroom during working hours. If the industry is experiencing a lack of well-paid operatives for higher processes and this is due to inability to hold the beginners in the industry or inability to train sufficient numbers of those whom they hold, the indications all point to the possibility of great good from some form of publicly supported trade instruction.

Training for foremanship

The last paragraph suggests to us the importance of knowing whether the industry under consideration finds difficulty in getting operatives for its highest-paid positions. This is true of structural-iron workers. It is the case in department-store work, and less than two years ago President Vail, of the American Telephone and Telegraph Company, stated that he would gladly employ twenty-five men at ten thousand

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dollars a year each, if he could find men in his business who were capable of earning those salaries. Such a statement shows us at once that it may not be only a question of filling such positions as require extra skilled men; but it may reach also to the positions of foreman, assistant superintendent, and even superintendent or general manager. These latter cases are especially difficult, inasmuch as they cannot be filled by normal advancement from the ranks.

Where such difficulty is experienced, it is usually possible to form a class of picked employees and, by carefully restricting the personnel of the class, make a successful effort to train especially for the duties of foreman and superintendent. Thus, where a large number of foreigners are employed in street-pavement work there is not sufficient content in the work of the average laborer to justify a publicly supported school for this trade; but a carefully selected group might well be trained in the fundamental principles of the trade, with the direct intention of fitting these men as section bosses and gang foremen. Later, some of these men might be expected to go of their own volition to a more advanced school where they could find training in the elementary engineering branches that

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would enable them to become job foremen and contractors. This suggests the whole question of training for foremanship and superintendency.

In foreign countries, especially Germany, the day-school work in industrial lines and technical branches below the engineering grade is almost exclusively given over to the preparation of foremen or mechanics of particularly high skill. The Sunday morning schools for apprentices and journeymen are the only exceptions to this in Prussia, and so carefully are the courses and students selected for the other day work that, whereas Hamburg has 3520 students enrolled in its evening classes of all grades of industrial work, there are only 186 registered in the regular day-school trade classes exclusive of Sunday. Moreover, this day work is entirely optional and elective, very little effort is made to advertise it, contrary to the custom with evening classes, and the entire conduct of the schools is based upon the principle that those men who are mentally and physically qualified for positions of trust and importance will see the value and need of special training and be willing to sacrifice the time necessary for electing one of the advanced day courses. It has always appealed to me that one of the great, if not the greatest, province of

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the industrial day school was this fitting of a self-elected and school-selected group of superior men and women for places in the forefront of their industry, leaving the continuation day school, the evening school, and the short-unit course to handle the bulk of the lower-grade work. Thus in any of the instances cited thus far in our study of a particular industry, whether it offers advancement from the ranks or not, so long as it is not morally degrading or physically dangerous, we may be justified in attempting to register a superior but small group of ambitious workers and train them for efficiency in directive capacity. This we may do even where we have previously decided that it was not the duty of the community to offer general training to the personnel of the trade.

In respect to creative ability all men are not created equal, despite the fact that American tradition has led many to believe they are. There is a danger that the enthusiast in industrial education will overlook the greatest factor in industrial progress, the unequal man. Not unequal because of inferiority, but by superiority. It is always the unequal man who creates; the others are intelligent or unintelligent accepters. The classical traditions of education have grouped them-

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selves around the unequal man and have left the masses to accept or not as chance might decree.

Industrial education, which is the outcome of a sharp reaction against the selfishness of class education, thinks first of the masses, as it should, but it must not neglect those who are by nature selected to be leaders. It is the duty of present-day education to select and train those who are to create, in order that a new and higher standard may always be presenting itself, and then to afford a mass education that will insure the ability of the great working class to accept and make intelligent use of these higher standards. Through this process, of the group rising to the new level set by the unequal man, has come all human progress.

THE ALLIED INDUSTRIES

Returning now to our direct inquiry, we must determine next whether there is a group of allied industries closely connected with our main industry. Thus collar-making has connected with it paper-box factories, printing-shops, laundries, and advertising agencies; paper-making plants often own their own forests; refrigerating plants, fertilizer factories, car building and repair shops and transportation agencies are all allied to the

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meat-packing business as a central industry. Chemical and drug manufacturers employ painters, glaziers, varnishers, and oil refiners.

Are the children and young workers being fitted for any of the allied groups? How many of them are retained as workers in these allied trades? It is not at all uncommon to find grouped around some great industry, which in itself offers only low-skilled occupation to the worker and no opportunity for advancement, several smaller industries or trades dependent upon it, and requiring more skill and personal talent than the main industry itself. Thus, printing has lithographing, book-binding, and engraving; carriage and automobile firms have painting, upholstering, and decorating; all mills and factories have skilled repair men, and nearly all plants where assembling parts is the main feature are dependent upon a larger number of allied or semi-allied trades requiring more skill than the central plant. Having refused public support to training for the larger industry, we may find that these allied industries offer an outlet for some of the workers in our treadmill processes, if an opportunity be given them to prepare for this new work. If one or more of these trades find difficulty in securing men and women competent to do their work, if

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no effort has been made to select and transfer to or otherwise fit for any of these allied processes, a school or class might well be started to prepare the workers in one branch to fill these more desirable places in the smaller branches.

Industries for adult beginners

Again, we must know whether there are any industries that require adults as beginners and from what source they draw their supply of workers. Do they want untrained beginners in these industries? Do the left-overs from our first industry go into these trades when they are old enough? How many of them? Do they make better workmen because of their apprenticeship in the first industry or is it valueless and even a handicap to them? An apprentice boy cannot become a fireman, a policeman, a motorman, or a stationary engineer. Where do the men come from who fill these positions? Running an elevator might be some help to the boy who later becomes an engineer or a motorman, but it would not help him to discharge the duties of a policeman. If he wished to become a policeman and intended to become a policeman, is there any job open to him as a boy that will aid him in preparing for the duties of a policeman? Have we

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some industries that take children into an apprenticeship offering good opportunities, but demand them before a certain age and untrained, thus closing the doors to those who have already served in our first industry? The maximum age limit for apprentices is fixed at eighteen years by the Brotherhood of Bookbinders and by Journeymen Stone Cutters.

An industry that requires adults as beginners is always short of help unless it be for common day labor: if there is no opportunity for advancement in our main industry, if there are no allied industries open to them, we may yet find it advisable to select a group and prepare them for one of these industries that require age and maturity. There are positions on the railroads, for instance, that cannot be filled by minors or apprentices, and yet the training for them is usually a long and tedious process undertaken by the man when he enters the railroad employ after working six or seven years at some employment that was simply a blind alley. A careful survey of such industries as this should be taken into consideration whenever a large number of workers in blind-alley or no-prospect industries have been left out of our industrial scheme, because their business offered nothing for which to be fitted.

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Vocational guidance

In cases where industries having opportunities and apprenticeship refuse to accept the overflow from our blind-alley occupations, a State-wide department of vocational guidance, able and willing to give wide publicity in specific and concrete form to the advantages and disadvantages of the various lines of work offered beginners, by thus pointing out at the start the desirable and undesirable jobs and the proper time for selecting the former, will do these workers in blind-alley trades more good than any system of trade schools that can be devised.

The natural tendency of the young worker is to look for a job with good pay in the near future, and to reject places with lower pay at the beginning, but higher wages at the top. The workers in positions of the first type should be stimulated to prepare themselves for industries with long processes and lower pay, but leading to permanent and satisfactory wages after the years of apprenticeship.

Right here let us find out what becomes of the other children that pass out every year from our industries which offer work of the simplest kind at the lowest wages, the children that we have

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not and cannot find a place for in any of our foregoing planning. Do they go into unskilled trades? What trades? What percentage of them are successful from the community's viewpoint? Have they any information to guide them in selecting another job? Did they ever think of this while applying for or working in their former places? Here is where the bureau of vocational guidance and the department of trade training touch each other closely. Some of these "unskilled" occupations are very desirable in certain localities. It may be well even to go so far as to start short courses in training for the general principles of some of these occupations, whereas others will prove most uninviting. Lectures and pamphlets, backed by investigation, can be given to young workers to open their eyes to the blind alley they are already in, and assist them in making a sensible choice for the future, whether they go into a trade school to prepare for some skilled trade or enter directly upon one of the so-called unskilled but lucrative occupations. I am personally acquainted with a man who has a large yearly income from the collection of flag in our swamps and who was led into this business by reading a pamphlet sent out by some society for agricultural promotion.

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This State-wide publicity will have other beneficial effects. It will not only aid us in "fitting the man to his job," but it will help most effectively in "fitting the job to the man." What effect do you think it would have upon the "place of work" in your State, if a fearless but absolutely fair report should be distributed among its workmen, containing the names of plants and industries where the surroundings were dangerous and unhealthful, due to a lack of remedial effort, and so warning parents against allowing their children to enter these places in search of work? Even where by nature the work was dangerous, an improvement in safety appliances, ventilation, etc., would be sure to follow such publicity, and at least the worker entering the industry would do so with full knowledge of the dangers included and the means of avoiding them which he should expect to find in use.

II

MAKING THE SURVEY

As the reader has very possibly discovered before this, the collection of the various facts and answers called for in the foregoing pages constitutes nothing more or less than a survey, an industrial and educational community survey.

TWO ASPECTS OF THE SURVEY

An industrial survey of a community is an organized and systematically conducted study of the local industries, to ascertain the advisability and the possibility of training beginners to enter these industries or assisting those already at work to increase their trade and technical knowledge.

An educational survey is a similar study of the existing schools and educational institutions of the community, to find out in what measure they are at present offering the general, technical, or trade training called for in the industrial survey, and also the possibilities for reorganization and additions which will enable the existing institutions to supply these demands.

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From a combination of these two surveys the director and his staff can present a complete report of industrial and trade needs of the locality — what part of these needs are being and can be provided for in the regular educational system, just what needs must be provided for outside of the present local educational institutions, and finally, where and how these latter needs are to be taken care of most advantageously.

The success of the survey will depend first of all upon the personality, experience, and fidelity of the director and his assistants. It is manifestly impossible to lay out any program of procedure that will insure these requisites, but it may be urged that great care be exercised to select persons who are familiar with and in sympathy with the four great general lines of activities that must be considered, namely, those of the educator, employer, employee, and trade unionist. Some member of the director's staff should have survey experience, especially along the lines of statistical classification and interpretation, and one or more of them should have experience or have thoroughly studied the science of preparing and presenting a survey report.

Aside from the foregoing, the success of the survey will depend in large measure upon the

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organization and plan of the work to be done. A perfectly clear and definite outline must be evolved. Its parts must be classified, the points sought must be grouped in some logical order, the exact reason for each step must be clear, the assignments must be definite and the time, place, and manner of returning each sub-report must be specified. The reception, classification, and recording of these reports must be provided for, consultations between workers must be arranged, and follow-up questions to clear foggy issues must be included in the general scheme. More important still, arrangements and agreements must be made beforehand with the employers and employees of the industries and particular plants to be studied, insuring their permission for and coöperation in the work of the survey members and accurate and ample figures and facts upon which to base conclusions.

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To illustrate the method, care, and precision with which such a survey should be laid out, I cannot do better than to present here a brief outline of the industrial survey conducted by Mr. Prosser and his assistants in the city of Minneapolis: —

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The survey material

Various agencies coöperating to make the survey a success and the part of each

1. The Survey Organization.

Director and assistants: Lays out and conducts the actual field work; receipt and classification of statistics and facts and most of the interpretation of the same.

2. The Local Survey Committee.

Business men and educators of Minneapolis.
General advisory with some personal assistance.

3. National Society for the Promotion of Industrial Education.

Starts the survey through its secretary, who is director of the survey, contributes personal assistance through other officers, and gives publicity and assistance through its influence, publications, and conventions.

4. University of Minnesota.

Details a committee to conduct a special study of commercial education under direction of a special investigator. Agricultural school of the University details one woman and twelve to fifteen girls to study training of home workers. Clerical force provided by University Research Bureau and volunteer students of summer school. Group of students to make a study of the facts for purposes of Industrial education in Minnesota.

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5. Minnesota Department of Labor.
Details employee to assist in the study of commercial work. Supplies the services and pays all expenses for studying the following points: —
 - Statistical information for 1914 report.
 - Irregularity of employment and seasonal trades.
 - Trade unionism's part in trade organization.
 - Correspondence school instruction.
 - Number employed in each occupation for each industry.
 - Apprenticeship and training of young workers.
 - Special firms and their specialties.
 - Handling information from inquiries on question of further training for workers.
6. Minneapolis Civic and Commerce Association.
Contributes material of its 1914 survey.
Assistance given by the director of the former survey regarding schedules, etc.
7. Minneapolis Board of Education.
Contributes \$3500.
Gives services of attendance officer three days each week.
Contributes part time of other officials.
Vocational Guidance Bureau gives assistance.
8. Dunwoody Institute.
Contributes \$3500.

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Principal of the school assists the director.

Makes study of "noncommissioned officers of industry."

Makes study of apprenticeship training.

Classification of all occupations in Minneapolis

Here follows a general classification of the industries into nine large groups with the total number of employees in each group. The groups are: —

1. Manufacturing and Mechanical Industries.
2. Trade and Commerce.
3. Domestic and Personal Service.
4. Transportation.
5. Clerical Occupations.
6. Professional Service.
7. Public Service not elsewhere specified.
8. Agriculture—Forestry and Animal Husbandry.
9. Extraction of Minerals.

Occupations not to be considered

Certain occupations that it has been decided not to deal with are next tabulated as follows: —

Transportation, Professional Service.
Public Service, Agriculture, etc.
Extraction of Minerals.

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Groups that will be studied

Those of the groups that will be studied are then listed, with notes concerning the nature and extent of the work to be allotted to each. A few examples will suffice to illustrate this: —

- A. Manufacturing and Mechanical Industries will be most thoroughly investigated.
- B. Domestic and Personal Service will be covered as far as possible by the woman in charge of the study of "women's work."
- C. It will be attempted to have a study of Commercial Training for clerical occupations made by some outside agency coöperating with the survey, as the cost, approximately \$1200, cannot be met by the funds available for the survey.

And so on.

Subdivisions under general occupations

The director proceeds next to divide the general occupations into specific industries with statistics regarding the workers in each separate industry. The first general heading is, naturally, "Manufacturing and Mechanical Industries," and it is subdivided into fifteen subheadings as follows: —

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- | | |
|----------------------------|---------------------------------|
| 1. Building Trades. | 9. Supervisors and Technicians. |
| 2. Clothing. | |
| 3. Lumber and Furniture. | 10. Food and Grain. |
| 4. Chemical and Drug. | 11. Printing and Engraving. |
| 5. Textile. | 12. Boots, Shoes, and Leather. |
| 6. Clay, Glass, and Stone. | 13. Tobacco. |
| 7. Liquor and Beverage. | 14. Jewelry. |
| 8. Metal Industries. | 15. All other industries. |

For each of these industries a set of statistics is given; as, for example: —

3. *Lumber and Furniture*

Total Number of Persons Employed

<i>Skilled</i>		<i>Semi-skilled</i>		<i>Laborers</i>		<i>Total</i>
<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	
1272	15	1379	42	1347	10	4065

From these figures grand totals are found for each group of general occupations.

Industries in the manufacturing and mechanical group that will not be studied

Those of the above group that will not be considered in the survey, or will receive only partial consideration, are now listed, with the reasons

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why the survey committee has not included them in a list to be thoroughly examined: —

Tobacco, Liquor and Beverage, Chemical and Drug, Jewelry, Clay, Glass, and Stone, Supervisors and Technicians, and All Other Industries are so set aside by the Minneapolis survey for partial, incidental, or no consideration.

Take Clay, Glass, and Stone, for instance. It is first divided according to the following table: —

	<i>Skilled</i>		<i>Semi-skilled</i>		<i>Laborers</i>		<i>Total</i>
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	
Glass-blowers.....	5	0	188	3	12	0	208
Brick, tile, terra-cotta..	0	0	9	1	134	1	145
Lime, cement, gypsum..	0	0	39	0	95	0	134
Marble and stone.....	145	0	40	0	37	0	222
Potteries.....	0	0	7	0	0	0	7
	150	0	283	4	278	1	716

The director and his assistants proceed to analyze the above table to decide the advisability of a careful study of these trades.

First, "Marble and stone" is set aside, to be dealt with in connection with the building trades. It is next decided that "Lime, cement, and gypsum" constitutes too small a field for study and the plants are too scattered. It is seen also that no skilled labor is employed in that work. "Potteries" is also discarded as too small. "Brick, tile,

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and terra-cotta" is also discarded as too small and unskilled. "Glass-blowing," it is decided, is purely mechanical and cannot be taught except "on the job." The committee state, however, that it is worthy of study, but cannot be considered because of its unimportance in this locality—only five skilled laborers being employed.

The survey authorities also note that the art side of marble, stone, pottery, brick, tile, and terra-cotta will receive attention under a separate study of "Art in Industry"; thus a special study of them is not needed. Jewelry, for instance, is omitted from consideration as a manufacturing industry because its greatest need is training in taste and skill in applied design, which receives full consideration under "Art in Industry."

So the different trades that are to be omitted are taken up step by step, classed for indirect study or discarded entirely because of small size, unskilled nature, undesirable influence, or unimportance which justifies their rejection.

Industries in the manufacturing and mechanical group that will be studied

1. Building Trades.
2. Metal Industries.
3. Clothing Industries.

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4. Lumber and Furniture.
5. Food Industries.
6. Textile Industries.
7. Leather, Boots, and Shoes.
8. Printing and Engraving.
9. Foundry Operations.
10. Engineers.

Each of the above subdivisions is then taken up and again subdivided into individual trades, dividing the workers as to skill and sex the same as in the preceding tables. The subdivision of the metal trades is here given in detail as an example:—

	<i>Skilled</i>		<i>Semi-skilled</i>		<i>Laborers</i>		<i>Total</i>
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	
Moulders, founders, cast-ers	460	0	0	0	0	0	460
Tinsmiths	382	0	0	0	0	0	382
Boiler-makers	304	0	0	0	0	0	304
Fillers, grinders, buffers ..	110	0	0	0	0	0	110
Mechanics	212	1	0	0	0	0	213
Oilers of machinery	136	0	0	0	0	0	136
Blacksmiths	755	0	0	0	0	0	755
Machinists, millwrights ..	2894	0	0	0	0	0	2894
Furnaces and rolling mills	26	0	161	0	177	1	365
Structural-iron work	36	0	0	0	0	0	36
Copper and brass factories	9	0	12	0	4	0	25
Automobile factories			56	2	28	1	87
Car and railroad shops			595	2	173	0	770
Lead and zinc factories ..			7	0	0	0	7
Tinware and enamelware ..			20	0	13	0	33
All others			892	48	444	5	1389
	5324	1	1743	52	839	7	7966

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The table is then analyzed.

"All other works" is to be omitted as "too indefinite and scattered." Structural-iron work it is decided to handle in connection with "Building trades." Copper, brass, lead, tinware and enamelware, and zinc are discarded because the number of workers represented is too small. Automobile factories are not considered for the same reason. It is interesting to note here the part that local conditions play in the survey and its analysis. In Detroit, automobile factories would have been studied as one of the great factors of the metal trades. The ten remaining trades, after the above are eliminated, are then set down for consideration and study.

The committee notes further, "The classification given above for the census is an awkward one for our purposes here. In general all the remaining occupations in the table and others will be covered in the study of establishments."

Domestic and personal service

Each of the fifteen trades of the manufacturing and mechanical industries to be studied having been given the same minute preparatory analysis as that for the metal industries, the survey proceeds next to take up the second large divi-

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sion of occupations to be considered, "Domestic and Personal Service."

This larger group is broken up into twenty-nine individual occupations, exactly as has been done for the manufacturing and mechanical industries, and then in a similar manner those which are to be studied and those which are to be omitted are grouped separately. The entire process is essentially the same as in the examples previously given, and is repeated just as carefully for each trade under each general occupational heading in the first table of industries.

Instructions for field workers

In order that those who are to do the actual field work of the survey may follow a uniform and intelligent method, insuring the collection of all the information needed, there were prepared sheets of directions for field workers. The importance of such directions cannot be overestimated and the more detailed they are the better, provided the investigator is not hampered by useless red tape.

Memorandum

In the first place, each worker receives a memorandum giving him the list of all the survey material he should have before entering upon his

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investigations. The serial number and the form number of each piece of material, chart, card, or direction sheet is given on this memorandum, and as all the written and printed matter is classified according to some form number and some serial number, this memorandum "provides identification numbers so that the material can be called for readily at the office." From the list the investigator can locate at once all or any part of the material he will need at any time. A copy of the memorandum follows: —

Serial I. Form 5-a.

Memorandum to field workers giving general serial number and form number for all material called for by the "Instructions to Field Workers"

The reference numbers are as follows: —

A. For material under I of "Instructions": —

1. For scope and guide charts.
 - (a) Preliminary Survey Serial I Form 1
 - (b) We want to know: —
 - From the schools Serial I Form 2-a
 - Training for industry " I " 2-b
 - Kind of jobs in industry " I " 2-c
2. Departmental chart " I " 3
3. "Suggestions bearing on departmental chart" " I " 4
4. "Memo. of statist. information" " I " 6
5. Information from Employers (items 3 to 8, dept. chart) " I " 7

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6. Occupation cards, 25 in set.	Serial	I	Form	8
7. Flour mill	"	III	"	6
8. Letters of introduction	"	I	"	9
9. Statistical information	"	II	"	1
B. Material under V of "Instructions": —				
1. Place of art in industry: —				
(a) Manufacturers' schedule	"	IX	"	1
(b) Specialty stores schedule ...	"	IX	"	2
(c) Department stores schedule. "	"	IX	"	3
2. Noncommissioned officers of industry	"	XII		

Departmental chart

To illustrate the detail to which these directions have been worked out, let us select topics 2 and 3 under division A on the memorandum.

The first is the departmental chart. This is a chart, 19 x 30 inches in size, with three large headings at the top, "Industry," "Establishment," "Department." Down the left side are twenty-six question groups needed for the report of the study of a particular industry, plant, and department. These questions relate to the job, its nature, its wages, its workers, its prospects, its required training, — in short, the points which when filled in on the chart will enable the survey committee to analyze intelligently the department and establishment represented and its contribution to the general knowledge of the industry in which it is classified.

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Suggestions bearing on the departmental chart

The second topic selected, or number 3, is a set of suggestions for field workers regarding the use of the departmental chart. They are very full and exact and much more complete than the synopsis of them which is here given.

The questions on the departmental chart are arranged on the sheets of suggestions in the order that they appear on the chart and are numbered as on the chart. Under each of these numbered headings the field worker is given suggestions as to the meaning and scope of the question, the best method of approaching it, and the details of information that are desired.

When it is remembered that this is done specifically for each one of the twenty-six questions on the chart, it will be seen how important such directions seemed to the survey committee.

As an example, take the directions given for question 9.

9. What the Worker Does in the Occupation.

1. What are the important operations performed by the worker?

What is wanted is not a description of the manufacturing process in which he is engaged, but an account and description of what the worker himself

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does. Watch him work. Keep your eyes on his actions, not those of the machine, and record those actions that are important, showing judgment, skill, experience, or responsibility.

2. What is the responsibility of the worker?

By this is meant what is the essence of the task he performs, where his responsibility begins and ends.

3. Illustrations.

Below are given statements of what the worker does which illustrate what is meant by the above.

Further instructions for field workers

In addition to the above detailed suggestions, each field worker receives general instructions regarding the investigation he is doing. The following important points may be noted: —

Materials and aids

I. The worker should have these things in his possession.

1. Four scope and guide charts.

(1) (3) Typewritten copies of the charts,
“We want to Know.”

(2) Typewritten copies of the charts,
“Preliminary Survey.”

(4) Pertinent and significant information should be noted, whether called for by the departmental chart or not.

2. Some twenty-five or more copies of the departmental chart.

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3. A copy of the "Suggestions bearing on the Departmental Chart."
4. A few copies of "Memorandum of Statistical Information from Employers."
5. Some thirty to fifty copies of a blank reading "Industry-Plant-Location." One card for each occupation in the plant.
6. Blanks for items on departmental chart.
7. A write-up of the study of the flour mill industry. A guide, not a copy, of what the survey is trying to get.
8. Letters of introduction and recommendation.
9. Statistical information furnished by the State Department of Labor. Name, location, number of employees, specialties, etc., for each firm.

II. Directions to field workers assigned to the study of an industry.

[Here follow specific directions for the guidance of those possessing the material before mentioned and preparing to use the same. The directions are numbered and like the "instructions" are much fuller than the general suggestive outline given here.]

1. Not all establishments can be studied; take one of each important kind or type, each to be thoroughly analyzed and described.
2. Using the statistical sheets from the State Department of Labor, analyze all establishments of the city in the industry; choose one of each

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type and submit analysis and choice for approval.

3. Take letters of introduction to the office of each plant studied; explain what you want to do; ask for assistance of the director if permission is refused.
4. Get an analysis of the plant into departments from the manager or superintendent. Get an analysis of each department into jobs in order of sequence from the superintendent or department head.
5. Have the office of the firm fill out blanks (see No. 5, under 1, page 60), one for each occupation in the plant, answering questions 3 to 8, inclusive, on the departmental chart. (These questions have to do with employees hired and dropped and with wages.) Information strictly confidential.
6. Interview foreman or department head to get answers for questions 9 to 26, inclusive. Use answer blanks (No. 6, under 1, page 60.)
7. Study the occupation yourself; go to the worker and check your information; work back and forth between foreman and workers. Try different workers. (Use blanks Nos. 3 and 6, page 60.)
8. When certain your information is correct, transfer to the departmental chart. Give cross-reference to answer blanks.
9. Study only one establishment of a type. Finish up and write it up before starting a new type.

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Use of cards for field notes

10. A quantity of 4 x 6 cards for each question on the chart, except No. 1, with headings for reference and filing.
11. Where obtained (here directions are given).
12. Where to use, interviewing foremen, workers, etc., and in conferences with advisory committees.
13. How to use them; one card for each interview, etc.
14. What to put on them; everything of significance, etc.
15. What to do with them; assemble by "jobs or occupations"; use in forming concise statement of your conclusions, etc.
16. Where finally to leave them (directions given).
17. Minimum number of cards, twenty-five for every job studied.

The reader will note here that the field worker has three different blanks for constant use. First, there are sets of twenty-five different cards, several of a kind, perhaps, one for each interview, but all pertaining to one job (see No. 6, page 60); second, are the blanks No. 5, under 1, page 60, one for each occupation or job in the plant, upon which are recorded questions regarding salary, hiring, dropping, etc.; and lastly, is the departmental chart, to which all the above in-

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formation is finally transferred in condensed form. The plant is then before the committee in complete form — individual opinions, jobs, departments, plant.

III. The write-up of each study made.

[Under this heading are given very complete directions concerning the manner in which the information ascertained by the field workers is to be prepared and written up.]

1. From your notes write up the study of the industry. Confine yourself to items on the departmental chart. Supply the office of the survey with information of any kind suggested by any of the material under No. 1 above.
2. Study the write-up of the flour industry. Do not follow it, but be guided by it.
3. Outline the way you propose to "put up" your material and submit same for approval.
4. Tell your story in the simplest language and most direct way possible.
5. Submit your write-up for consideration and suggestion and rewrite until you get it right.

Conferences with representatives of other establishments of the same type

1. Conferences will be arranged with as many employers of the same type as possible. Where business is organized, a joint conference of both employers and employees will be arranged or a

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separate conference arranged with each. Conferences will be held with advisory committees for all trades that have them.

2. A copy of your write-up will be put in the hands of each member at the conference or sent to him in advance. It will be gone over word by word for criticism and suggestion.
3. Rewrite until your story is approved by the trade and the office.

Other things to watch and do

Watch for the place of art in the industries you study. Study the noncommissioned officer in each occupation. Analyze and make notes regarding points needed above those of the ordinary worker and such technical information as will help to reach these positions.

Get information regarding the kinds of schools and classes recommended by the trade for training preparatory to these occupations. See special instruction sheet.

Special instruction sheet for training

COULD SUCH INSTRUCTION BE MOST PRACTICALLY AND HELPFULLY GIVEN INSIDE OF THE INDUSTRIAL ESTABLISHMENT, OR IN PART-TIME DAY COURSES, OR IN EVENING CLASSES IN SPECIAL SCHOOLS?

1. At the outset, the investigator must be able to explain what is meant by the different kinds of part-time schools and evening schools. This should be talked over with the director.

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2. Here again opinions of foremen, gang bosses, superintendents, and workers should be gathered.
3. So the opinion of the field worker should be written.
4. The director should gather same material from the advisory committee.

This constitutes the general lay-out of the entire industrial survey. If the reader will study it carefully, in connection with the report of the National Society for the Promotion of Industrial Education on the Minneapolis Survey, he should have at hand all the general information necessary for planning and carrying out a similar survey in his own locality.

THE EDUCATIONAL SURVEY

It remains now to say a few words only regarding the educational or school survey. School surveys are not uncommon in this country, and are much easier to conduct than industrial surveys, and for this reason only a few general suggestions and a few details are included in this study.

Extent

To give anything like a comprehensive view of all the educational opportunities offered by a community for advancement in industrial lines,

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the investigator must examine much more than the curriculum of the ordinary public schools. Here consideration must be given to existing part-time and evening schools, private schools, Y.M.C.A. classes, commercial schools, classes conducted in commercial plants, and correspondence instruction. Before beginning the study of any of these groups, it is well to associate with the investigator an advisory local committee of influential men who will assist and support the movement and help with the deduction of principles.

The public school

It is usually easy for the investigator to secure the course of study of the public day schools. The subjects therein given for the upper grades and high schools should be classified under three heads: those in no way related to industrial and commercial education, which group is eliminated; those indirectly bearing upon trade proficiency, set aside for further consideration; and those of a direct vocational nature.

The classes of semi-industrial nature, such as economics, commercial geography, arithmetic, drawing, and chemistry, are then considered in the light of the findings of the industrial survey to see which of them, if any, are most likely to be

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supplying the educational wants shown by the study of the industries to be real needs. These classes will merit the most careful investigation. The other semi-vocational subjects may be given consideration as far as time and money permit, for the investigator can never tell where he may open up an unthought-of opportunity for advancing technical information. Those public-school classes that are directly for vocational purposes, including all manual training, prevocational instruction, vocational schools, trade schools, etc., under public direction, will naturally receive very careful attention.

From these investigations the survey must establish how, when, and to what extent the public schools are providing the education, technical knowledge, and special information that has been shown to be necessary for carrying out the local industrial program. It must determine where and what the omissions are and find the responsibility for such omissions if they are chargeable to the already existing classes. It must decide what additions, changes, and readaptations are desirable both for the schools and the industries, and it must set aside those educational phases of vocational instruction that do not fall within the province of any public school.

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Part-time and evening schools

A careful survey must also be made of the part-time and evening schools, which are usually a most fruitful field for extending technical and trade information. Something of the scope of such an inquiry may be seen from the following outline used in Minneapolis: —

Serial VIII. Form A.

Questions submitted to evening schools

- I. What courses did you conduct in industrial, technical, and business subjects?
 - a. How many classes in each subject?
 - b. Total enrollment in each subject?
 - c. Average attendance?
 - d. Evenings a week?
 - e. Weeks in the year?
 - f. Total number of class meetings during the course?
- II. Entrance requirements: —
 - a. Age?
 - b. Scholarship?
 - c. Experience?
- III. How do you get the pupils for the classes?
 - a. By advertising?
 - b. By solicitors?
 - c. By correspondence?
 - d. Other methods?

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- e.* Are your present methods of securing students satisfactory to you?
 - f.* What methods are used to secure regular attendance?
- IV. Have you specified times for admitting pupils?
- a.* Have you preliminary registration or are pupils admitted at any time?
 - b.* If pupils are admitted at any time, how do you group them?
By their desires? . . . Or by their fitness, determined by conference with instructor or director?
 - c.* To what extent are students grouped according to their occupations or experience?
 - d.* If possible, please give the registration in each class by occupation.
 - e.* What proportion of your students attend for two years? For three years?
 - f.* What proportion of your pupils have had correspondence-school courses?
- V. What tuition is charged for the instruction?
- a.* Is tuition "by the term," "by the course" or by the lesson?
 - b.* What additional fees are charged?
 - c.* Is any part of the tuition refunded?
On what conditions?
 - d.* What tools, supplies, or texts are furnished by the student?
 - e.* Approximate cost?

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VI. Instruction: —

- a.* Is instruction by lectures?
Class instruction?
Or individual instruction?
- b.* How many subjects may the student pursue in one term?
- c.* Describe the equipment of the school for doing the work of each course.
- d.* To what extent are textbooks used in various courses?
- e.* Name texts used in each class.
- f.* Are examinations given?
- g.* Please furnish any examination questions which you may have in the subjects offered in your school.
- h.* What certificate or other acknowledgment of the successful completion of subjects or course is given?
- i.* What is the value of your certificate?
In your own courses?
In other schools?
In securing a position?
- j.* What facilities have you for placing graduates in positions?
What follow-up records are kept of graduates?

VII. Qualifications of instructors: —

- a.* Academic training?
- b.* Technical training?
- c.* Trade or commercial experience?

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d. Personal qualifications?

List of machines used in business courses.

VIII. Relations with employers: —

- a. Do employers come to you for help in securing promising employees?*
- b. What efforts do you make to inform employers that their employees are attending evening school endeavoring to make themselves more proficient in their work?*
- c. Do you have any advisory boards or conference committees of any kind from the business or trade to assist in standardizing your instruction? If so, what do these committees do?*

With the answers to these questions in hand and having selected and placed beside them the educational and trade needs of all the occupations not otherwise provided for, the investigator can quickly and somewhat surely lay out the courses and classes that merit particular inquiry. The results of his personal investigation are then added to those from the public-school survey.

Private and commercial schools

In most communities the private schools will be of a business-school type. Occasionally private industrial schools or institutes will be found and will be investigated, either under the plan

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laid down for evening schools or under the one herewith submitted for commercial schools:—

A. It is advisable first to form a committee of representative citizens.

1. Number to be decided, 5 to 10.

2. Duties:—

Criticism, suggestion, and support.

B. Study of the opportunities for commercial education given by the private schools.

1. The standard of judging the school is based on the following factors:—

(1) Prerequisite preparation of the pupils demanded by the school.

(2) Equipment of school.

(3) Experience and preparation of the teaching force.

(4) Attitude of teacher and principal toward —

(a) Education.

(b) Practical work.

(c) Placement.

(d) Follow-up.

(e) Survey.

(5) Estimate of type of teachers and pupils.

(6) General atmosphere of the classroom.

(7) Follow-up of school graduates: with comment from employers on work.

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- (8) Study of dropping out as a test of practicality of course.
 - (9) Giving of tests worked out by National Associated Schools of Scientific Business. These tests to be given to five representative pupils of graduating class of each school for the purpose of determining individual efficiency.
- C. The determination of the extent of solicitation on the part of private commercial schools.
1. Interview with all pupils who have registered and decided to enter private commercial schools upon leaving the eighth grade.
 2. The tentative investigation of typical schools: —
(The investigation being a determination of the number of eighth-grade children solicited, together with an interview with these children.)
 3. Selection of one class of freshmen in high schools as test for amount of solicitation private schools do in the summer.
- D. A comparison of the courses given in these schools with the commercial training found necessary to supply the requirements of local employers: —
- Are the courses full enough?
Are they too general?

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Is information accurate?

Are local commercial methods used and local conditions regarded?

Is preparation for specific work given or for general commercial uses?

Are necessary courses lacking?

E. Students: —

Are students selected for fitness?

Are students selected for age?

Is successful follow-up work done?

Have employers confidence in the work?

THE COMMERCIAL INDUSTRIAL SURVEY

If actual commercial opportunities and needs have not already been established in the course of the industrial survey, it will be necessary, along with the study of business schools, to conduct an investigation into the opportunities and requirements for office work and other forms of commercial employment. The following suggestions will illustrate the nature of such an inquiry:—

A. Investigation of the occupational opportunities in a large number of representative offices.

1. Types to be selected upon the advice of the advisory board and to include the entire range of work in small and large offices.

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2. Personal interviews with the employers on the question of the present success or failure of adequate preparation for office work on the part of public and private schools. The formulation of definite suggestions from the employer as to his requirements for the changes in the school curriculum which he is willing to advocate. His attitude toward coöperative classes.
 3. Checking of the list of office machines and equipment in use.
 4. Data on hours, wages, overtime, advancement, and physical conditions.
- B. Personal interview with boys and girls already placed in office work, for the purpose of getting the point of view of the worker in regard to preparation and opportunity.
1. 125 pupils from public schools.
 2. 125 pupils from private schools.
Random selection, 5 for each of the following years: —

1909-10	1911-12	1913-14
1910-11	1912-13	
 3. Individual records secured by settlements and social workers.
- C. Outline of opportunities for men and women.
1. Advanced positions of special responsibility.
 2. Direction of advancement from office work to any form of commercial work.

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(These facts to be obtained through the survey and by personal interview with men and women who have made good in business with a view of obtaining information as to the method of their success.)

3. Opportunities for commercial work of low grade in small establishments, and what is minimum of education or training necessary.

- (1) To meet the demands of the work engaged in.

- (2) To fit worker for advancement.

The conclusions and recommendations of the survey resulting from the entire investigation into commercial work and education may be then summed up something as follows: —

A. Summary for conclusions.

1. Basis: —

- (1) Present survey.

- (2) Survey of 1913 in Minneapolis, 1915 in Minneapolis.

- (3) The studies made in Boston and Cleveland, and the report of P. V. Thompson, "Commercial Education in Public Secondary Schools."

2. Interpretation of the evidence gathered as a means of throwing light on the organization of commercial work in public and private schools.

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- (1) Whether a four-year course is the best plan.
 - (2) Where the point of selection of definitely vocational courses should be reached by the pupil.
 - (3) Whether a two-year commercial course is necessary or valuable.
 - (4) Comparison of success of pupils —
 - (a) Of less than high-school education.
 - (b) Of less than common-school education.
 - (5) Whether a fifth year of expert technical training is needed.
 - (6) Need of standard of apprenticeship system —
 - (a) Through coöperative courses.
 - (b) Through probation period.
3. Concluding statement of the attitude of the survey toward public and private commercial schools.
- (1) What is their present function?
 - (2) Are any of their methods detrimental to the good of the student, the vocation, or the public?
 - (3) If these schools are found in any way to be either wasteful or detrimental, what is the fairest and best method of dealing with them?
 - (4) Are they filling all the needs of the local commercial occupations?

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- (5) If not, can they be reorganized to do so?
- (6) Are additional facilities needed for commercial instruction?

OTHER FORMS OF EDUCATION

The foregoing outlines will suffice to indicate the form of inquiry that would be made into Y.M.C.A. classes, private short courses, and correspondence schools. All these avenues of approach to the practically minded student should be included in the investigations of the survey. The correspondence school especially should be thoroughly studied to find out just how many people it is reaching, how long it holds them, what it actually does for them, their trade advancement resulting from this study, cost, methods of instruction, methods of advertisement and publicity, and such other facts as may help to show their value and true function in the local educational scheme.

What has been said here upon the educational survey is recognizedly far from complete, but it would seem that a pretty definite idea has been given as to the nature, scope, and method of such a survey, and this is the only end which it is possible to attain without going far outside the province of a book of this nature.

III

SELECTING THE COURSE

ADVISORY BOARDS

ONCE the answers to the inquiries suggested in our opening section have been fully formulated and the kinds and types of schools that should be established have been decided upon, it devolves at once upon the local authorities to prepare courses of study presenting the nature and details of the instruction to be given in each course and in each subject of the course. Where this instruction is to deal with direct prevocational training, trade-preparatory material, trade-extension work, or actual trade instruction for pupils over sixteen years of age, it is advisable and well-nigh absolutely necessary to associate with the authorities directing the work an advisory board of representative citizens to assist in the formation of courses.

An advisory board may or may not have executive powers, and its function differs from those of the regular board of education in that the former is a group of specially selected men who are par-

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ticularly fitted to give advice regarding the actual subject-matter to be taught and may not have any authority over the autonomy of the school, whereas the latter directs the actual business conduct of the institution and seldom is capable of giving expert advice regarding the information to be imparted or the means and methods used to impart it.

An advisory board should consist of from five to seven members, excepting where there are a large number of trades in one school, when it is well to have each trade represented on the board. In some cases it is found better to have a separate board for each skilled trade taught. This insures careful supervision of the material used for instruction, but may prove exceedingly awkward unless the function of such boards is purely advisory and not executive.

In general an advisory board should be made up of an educator, preferably the executive officer of the school, representatives of employers, or, better still, the employers themselves, and skilled employees from local plants. Wherever the trade represented has a local labor union, a representative of organized labor should have a place on the board. The personnel of the board should be selected with a view to preventing a monopoly of

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direction by any one interest, while affording representation to all, and at the same time bringing to the service of the school the intelligent advice, interest, influence, and standing of the strongest and most influential people of the locality.

It should be the duty of this board or boards to pass final approval upon the subject-matter of the trade instruction to be given, and also upon the order in which the various projects are presented. The members should also pass upon the equipment, nature, and price, before it is purchased, and upon all other matters that pertain distinctly to the technique and science of the business under consideration.

This board may also aid in working up coöperation between the employers of labor and the school by championing the adoption of such understandings as the one indicated by the following card, which is given by Rochester firms to young people applying for positions: —

At the present time this firm is only employing workers (under eighteen years of age) recommended by the Department of Public Instruction. If you desire a position we would suggest that you communicate with Raymond C. Keople, 308 Municipal Building. Hours 9 to 10 A.M., 4. 30 to 5.30 P.M.

YAWMAN & ERBE MFG. CO.

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By such means the trade schools reach many new pupils and the employers secure much better workers.

TRADE AGREEMENTS

One of the most valuable services that an advisory board can render to any school is to assist in bringing about a series of trade agreements between the school and the employers and between the school and organized labor. A trade agreement means a complete written understanding between the school and an employer of labor; for instance, regarding the instruction and training to be offered in the school and in the shop to workmen and apprentices employed by the contracting manufacturer. It specifies how long the course shall be, its details, how many pupils shall enter, and what shall be required for satisfactory completion of the work.

The school defines the arrangement of time in the week; the employer contracts to allow pay for certain specific school hours and agrees to hire so many graduates at a fixed rate of pay when the course is over, or to continue in his employ a certain number of graduates at a stipulated increase, if the men are already on his pay-roll. The trade union would at the same time allow a certain per

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cent credit on apprenticeship time to such of its apprentices as satisfactorily completed this extra work.

The above is an ideal case. In actual practice such agreements usually fall into four large divisions.

Tentative agreements

A tentative agreement is one in which the employer gives his approval to the idea of trade training for his men, agrees to urge his apprentices to take such training, and signifies his willingness to coöperate with the school, and to be guided in his selection and payment of apprentices by the results actually attained.

General agreements

In a general trade agreement the employer gives his approval to particular specified courses of study, and agrees to give those who complete these courses special consideration when he hires new men, and also to favor them in times of slack work when employees are laid off. An example of such a trade agreement follows: —

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Steamfitters

Memorandum of courses for journeymen steamfitters and helpers at the William Hood Dunwoody Industrial Institute for the year 1915-16: —

I. The approval of the union and the employer of these evening courses is asked: —

- (a) Free evening classes for journeymen steamfitters and helpers will be offered at the Dunwoody Institute for the year 1915-16.
- (b) These classes will begin in October and continue through the winter.
- (c) Classes will be continued so long as an average attendance of not less than 12 persons is maintained.
- (d) The following unit courses, attached to this report and marked "Exhibit A," will be offered.
- (e) Upon the completion of any unit course a certificate to this effect will be issued to the student by the Dunwoody Institute.

II. The approval by the union and the employer of this arrangement for the further training of helpers is asked: —

- (a) The Steamfitters' Union is to require all helpers entering the steamfitting work after August 1, 1915, to attend, for two

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seasons of not less than seven months each, evening classes at the Dunwoody Institute, bearing on steamfitting not less than two nights a week.

- (b) The employers shall agree to give preference in the employment of workers to the helpers attending such classes and in the reduction of their force in dull times to give the same preference.
- (c) That an advisory committee of five members be appointed by the trustees of the Institute, two of whom shall be employers and two employees engaged in the steamfitting business. The fifth member of the committee, who shall be its chairman, shall be a representative of the school.
- (d) The authorities of the school, with the advice and assistance of the advisory committee so secured, are to assist in standardizing the work of this dull-season school.

I }
We } hereby approve of the above plan and agree to
carry it out so far as I am }
we are } concerned.

(Signed)
(Name of person or firm)

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Specific trade agreement

The specific trade agreement is like the general trade agreement in that it specifies definite courses to be completed, with the nature, time, and other details of the course. It differs from the other agreements in that the employers here agree, either to hire a certain specified number of graduates each year, term, or other unit of time, or to hire as many of the graduates as trade conditions warrant at the time, and to start them at a fixed wage, given in the agreement, and to give regular advancement after three, six, nine months of work, or according to some similar scheme of wage agreement.

The following agreement, from among those now in use in the city of Rochester, will further illustrate this kind of understanding:—

For Mackinists

- i. That the Shop School shall give to boys who are not less than fourteen years old and who have completed at least the sixth grade, or preferably to boys who have completed the work of the elementary schools, a general industrial or “try-out” course of such length as the school authorities may deem necessary, and shall

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select those who have an aptitude for and an ambition toward the trade of machinist.

2. That the Shop School shall give boys thus selected a preparatory course of approximately two years, one half of each day being spent in shop practice and the other half in the study of shop mathematics, mechanical drawing, applied science, industrial history, civics, and English.
3. That upon the satisfactory completion of this course the metal trades employers of Rochester shall employ these boys in such numbers as trade conditions and shop management shall warrant, at the following schedule of wages: —

\$ 9.00 per week for the first six months.

\$10.00 per week for the second six months.

\$11.00 per week for the third six months.

\$12.00 per week for the fourth six months.

(Note). In the event of any boys earning by piece work more than the above scale, the balance shall be held back by the employer and paid to the boy as a bonus at the completion of the two years' apprenticeship.

4. That during the two years' apprenticeship the employer shall allow each boy, during working hours, an amount of time off equivalent to one half-day each week, for continuing his studies, such time to be taken when manufacturing conditions will best permit.

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5. That the first three months of employment, as provided in Articles 3 and 4 shall be considered a probationary period and the diploma of the school shall not be awarded until the satisfactory completion of this probationary period.
6. That the members of the Machine Industry shall select a committee of three of their number who shall: —
 - (1) Inspect frequently the work of the Shop School and offer criticisms and suggestions for the improvement of the work.
 - (2) Suggest tests that shall measure the pupil's progress in manipulation skill and technical knowledge.
 - (3) Suggest tests that shall measure the qualifications of boys for graduation.

*Board of Education,
Attention of Alfred P. Fletcher,
Assistant Supt., Rochester, N.Y.*

Gentlemen: —

We are interested in your proposition to train boys for the machinists' trade and if business conditions are normal, we shall be able, in 1916, to take two boys, 18 years old, as apprentices, after having completed a two years' course in the Machine Department at the Rochester Shop School. These boys will be employed by us at the following wage scale: —

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\$ 8.00 for the first six months.

\$ 9.00 for the second six months.

\$10.00 for the third six months.

\$11.00 for the fourth six months.

With a bonus of \$100.00 to the boy who completes two years' work with us.

We would be willing to allow the boy the equivalent of one half-day off weekly to continue his work in the Shop School and would pay him for this time.

Yours truly,

EASTMAN KODAK CO.

(Signed) J. H. HASTE, *Mgr.*

Agreement with Rochester Master Painters and Decorators Association

1. The Shop School shall give to the boys who are about sixteen years old and who have completed at least the seventh grade, or preferably to boys who have completed the work of the elementary schools, a general industrial or "try-out" course of such length as the school authorities may deem necessary, and shall select those who have an aptitude for and an ambition toward the trade of painting.
2. The Shop School shall give boys thus selected a preparatory course of approximately two years, one half of each day being spent in shop practice and the other half in the study of shop mathematics, mechanical drawing, ap-

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plied science, industrial history, civics, and English.

3. Upon the satisfactory completion of this course the painting employers of Rochester shall employ these boys in such numbers as trade conditions or shop management shall warrant, at the following scale of wages:—
\$2.00 per day for the first year.
\$2.50 per day for the second year.
\$3.00 per day for the third year.

4. The members of the Master Painters and Decorators Association of Rochester shall select a committee of three of their number, who shall, first, inspect frequently the work of the Shop School and offer suggestions and criticisms for the improvement of the work; second, suggest tests that shall measure the pupils' progress in manipulative skill and technical knowledge; third, suggest tests that shall measure the qualifications of the boys for graduation. At a recent meeting of the employers of painting, sixteen, or all present, agreed each to take a boy in 1916.

During the second year at school, the employers will use the boys whenever possible, and pay them \$1.00 per day.

Personal agreements

In some instances the employer has agreed with the individual apprentice directly, offering

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to hire or increase the wages of the worker *named* in the agreement after a certain number of weeks spent in the trade-instruction class, provided the agreement is countersigned by the school authorities at the completion of the period.

Of course there is every possibility for variation of the above to conform to local demands, but the principle of all trade agreements is the same, to offer an incentive to the beginner in the school and to provide assured outlet for the successful graduates.

With the advice and coöperation of the advisory board, the local investigator would now turn his attention to the problem of fixing the courses of study to be offered in the different classes that have been decided upon as a result of the survey reports.

DETERMINING THE COURSE OF STUDY

Well-organized, highly skilled trades

The simplest possible case is the one where a large number of beginners are employed in the early processes of an industry that follows these processes by others, growing more and more difficult, to which but few of these beginners succeed in attaining. Furniture designing, interior deco-

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rating, stained-glass window-making will illustrate this on the art side; astronomical lens-grinding, the boring and rifling of cannon, and work of like nature are other examples more largely dependent on skill.

Field for advancement

Where the number of skilled workers offering themselves for advanced processes is less than the number required, or where it can be shown that a fair percentage of the beginners can be provided for higher up when they are competent to advance, we have a clear field. All the industries just mentioned above are in this category, and as a more unexpected instance it may be cited that the demand for expert tinsmiths and cornice workers now far exceeds the supply.

On what does advancement depend?

Charles R. Richards, in his admirable treatment of this subject, points out that the first thing to determine is whether the advancement will depend upon skill alone, technical knowledge alone, or a combination of these two. Mr. O'Leary divides technical knowledge into two parts, "trade knowledge," generally picked up by the mechanic in his trade experience, and

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“technical information,” which comes from more or less formal study and training.

Trade needs determine course

In any case I maintain that the course of study must be based directly and in most cases absolutely upon the needs of the industry itself and not upon the value of the instruction from an educational or pedagogical point of view.

Need for skill

If it can be shown that skill alone is needed, then skill must be provided first, last, and always, no matter what else is taught. As examples may be mentioned machine-tending, and the work of packing, boxing, and sorting, ironing shirts, counting money, and many other occupations of like nature. The authority conducting the trade school should then study each successive step in the industry from a very different standpoint from that of the first investigation. He should find out in each detail of the work just what skill is required. Consult with experts and old employees to find out what parts in the different processes have proved the greatest stumbling-blocks to advancement. Such stumbling-blocks are the laying of round chimneys for the brick-

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layer, arches for the mason, irregular and conical roof-framing for a carpenter. He should lay out his course to provide this skill in successive steps, laying the greatest emphasis upon those parts that, in the experience of the past, have caused the retardation of the largest number. In other words, we must teach pupils the specific trade and the subjects taught must be determined by the actual demand of the employer.

Need of technical knowledge

If it be found that technical knowledge is needed alone or in connection with skill, provide for this technical knowledge, but do not confuse it with general technical knowledge. A carpenter wants no course in general mechanics, but a course in the mechanics of structural woodwork-ing. Provide your technical knowledge as specifically as you provide skill, based upon the same minute investigation of need and consultation with experts. Whatever general principles are needed, give them with their immediate application to the business in hand.

Both skill and technical knowledge needed

If it be found advisable to give both skill and technical knowledge, the foregoing principles

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will still apply, and the instruction in each of these branches should in general be separated from the other. There are occasions when both the skill and the technical knowledge may be given at one and the same time, when they must be given together; as in the case of a butcher, who can only learn the exact location, size, quality, etc., of different cuts of meat by actually engaging in the cutting of meat. In most cases, however, the skill must be given in the shop independent of both general and special information, and the technical knowledge can be given either inside or outside of the actual working place. Wherever it might meet, the class in technical information would be organized as a unit separate from the shop force. Whenever a class is organized in this way, as a distinct unit, there will arise the question, Shall it be a part-time class, meeting at hours set apart in the daytime, or an evening class?

WHEN SHALL THE INSTRUCTION BE GIVEN?

So long as the work is collateral with the years of apprenticeship it must be one of these two. But it is quite possible that the question will also be raised as to the value of giving certain technical information in an all-day school preceding the

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entry into industry or in a similar school following the earlier years of work and fitting for more advanced positions yet to come.

The day school

In such cases as those presented by electric-power-plant engineers and operators, stationary steam engineers, and expert telephone or telegraph erecting foremen and inspectors, there is good reason to believe that a one-year all-day course preceding the actual entry into the business would be valuable. Certainly a one- or even two-year all-day course following some years of apprenticeship and directed to the scientific study of the advanced theory and practice of these trades, together with efficiency, management, etc., will bring abundant financial return to any competent man who completes it. The chief engineer of a large car-heating company told me last year that he was not concerned for a trade school to teach the technique of his business, nor yet for a part-time school to assist in such teaching. He wanted boys to come to him already grounded in the fundamental principles of shop drawing, shop arithmetic, carefulness, accuracy, and attention to all directions, just such work as is given in the New York general industrial day

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school, and maintained that he would then teach them his business and guarantee them lucrative places. Before taking up, therefore, the part-time and evening schools, it will be well to give rather careful consideration to the problem of all-day trade-school instruction.

Three types of day schools

To my thinking, at the present stage of trade education there are only three types of all-day industrial schools that can justify themselves for public financial support. This does not in any way reflect upon the value of privately supported institutions which do not correspond to one of these types and of which there are numerous excellent examples in this country.

The prevocational school

The first of these three types is the commonly called prevocational school, which industrializes the final two years of an elementary-school course, and should be used only in districts where a large number of children attending the common schools come from the homes of tradespeople, a very small percentage of whom would give their children schooling beyond the elementary grades.

The course of study in such a school should

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bear upon a limited number of the most promising industries of the locality, and if it is partially State-supported, on a few of the most attractive general industries found in the State. The work of all the elementary grades preceding, which can be applied to these industries, should be applied; drawing, mathematics, and whatever else can be found fundamental to a group of the industries included in the curriculum should be given in concrete and applied form. The shop work should be varied enough to discover the special aptitudes of the pupils, but at the same time it should consist of actual trade processes, done to trade standards and by the approved methods of the commercial shop. The drawing and arithmetic should all originate in the shops through actual needs for the same. Although the finishing, tracing, and blue-printing may be done in the drafting-room and the mathematics problems worked out in the classroom, the moving spirit of this coördinated work should be an acknowledged need felt in the shop or workroom itself.

The elementary trade school

The second type of school is an elementary trade school, and offers training for those children only who are not yet sixteen years of age,

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who have completed the regular common-school course provided by the community, and who have definitely selected a trade which will not allow them to work as apprentices until after their sixteenth birthday. The purpose of such a school is twofold: to prepare for entrance into a skilled trade, and to prevent young men and women entering blind-alley and unskilled occupations because their chosen trade will not be open to them for one or two years. Such a school should not train, except on a part-time basis, for any calling that will accept its pupils in general productive labor. It should not accept pupils who have not completed the common-school course unless it conducts prevocational classes similar to those in type one. The curriculum of such a school will be essentially the same as that of the part-time school for the same trade, except that the shop work will all be done in the school and will include a large number of simple processes that were omitted from the specific shop instruction of pupils who are at the same time working in the trade. The classroom instruction in science, drawing, commercial geography, shop mathematics, or whatever is given, should be related to the real needs of the trade and not be influenced by the type of work done in the common

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schools. The shop work should be laid out in a system of definite steps based upon processes increasing in complexity and degree of skill required, rather than upon a series of jobs to help the pupil over stumbling-blocks and supplement the daily work in the trade, as was done in the part-time evening classes. It is often a very good idea to arrange these steps in groups, each group a short-unit course in form, but not in type, and these units linked together in logical order to shape the student's complete experience. A very large number of these steps — as many as possible — should be real commercial jobs and not mere exercises. A trade-school pupil might better be set to work with practice material to perfect himself in some process, in order to continue his work upon a commercial job by using that process on the job as soon as he is fitted to do it, than to be given an exercise piece upon that process, only to see the piece scrapped after completion and another exercise take its place.

This all-day school has two very decided advantages over the part-time and evening school. The first is an economic advantage, that of time. The pupil's entire day being under the direction of one superintendent, no time lost in going and coming from factory, and the shop practice be-

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ing laid out more exactly than is possible where production commercially is part of the scheme, enables the school to cover more ground in shop and class instruction than can be covered by part-time classes in the same number of days, even if the time given to shop work is exactly the same in both cases. The second advantage is pedagogical: it is the advantage of being able to control the pupil's entire experience, class, shop, play, environment during the daytime, associates, and instructors, and is more valuable for younger than for older pupils. It must be acknowledged that because of these advantages the supporters of all-day trade schools for all kinds of trade training have some very good arguments; but I am still of the opinion that where the part-time system can be established, the advantages to the apprentice outweigh the losses of the all-day system. The time spent in school will still dominate much of his experience, and there is no place in which to learn promptness, speed, obedience, trade standards, the value of time, value of material, value of initiative, the sociology of the wage-earner, and learn them well, that is the equal of a well-conducted shop, factory, or business house.

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The advanced trade school

The third type of all-day publicly supported trade school is the other extreme. It is the highest type of trade school imaginable below the technical college. To it should come men and women with distinctly assigned educational requirements capable of sustained interest and an appreciation of deferred rewards. This school should fit only for those of the high skilled industries that demand a large fund of technical information which it is difficult to acquire except through an extended course of training. Each course should deal with all the basic principles of the subject, the application of these principles, their coördination in the industry, and anything else that can be shown to be demanded for successful competition in that particular field.

For the present, at least, I should leave all the industrial education that falls between these two extremes to the part-time day school, the evening classes, and the short-unit courses, although I am convinced that the all-day industrial school must form the cornerstone of our great American system of industrial training, because it stands both below and above the other sources of training.

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Part-time and evening classes

We will return now to a discussion of the relative value of part-time and evening instruction, because the vast majority of employers will depend upon either the part-time or evening school for the training of their employees.

The part-time class has several advantages over the evening class. In the first place, a full and steady attendance is assured; it is more closely connected with real work in the mind of the apprentice if it comes in working hours; the students are mentally more capable of attacking new principles. In the cases of street-pavement layers, building carpenters, and men who work all day in the open air, this last factor is not so important; but for indoor workers in shops and factories, salesgirls, draftsmen, and workers in all such occupations the evening classes are likely to prove a mental and physical strain. The part-time class in a somewhat different form may also be adapted to the seasonal occupations. A large number of occupations, like road construction, farming, and inland water navigation, cannot be pursued at all seasons of the year. During slack seasons the younger of the employees may be in attendance upon a part-time school. In much

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the same manner the part-time class can be arranged to fit the slack hours of regular trades. A grocer needs his men in the morning and a baker does not. A barber has dull hours that are almost always the same from day to day; similarly with the hotel-keepers and restaurant proprietors. The part-time school may fit their needs exactly. It would appear, therefore, that where the part-time class can be arranged for, it will certainly give good results, as will also a combination of part-time and evening work as described later; but considering all types of classes that might be formed and the general attitude of the employer as it is expressed to-day, in most cases an evening school will do the most good to the largest number.

Right here let me say that two nights a week, with good attendance watched and enforced, is much more valuable than four nights a week, with twenty-five to forty per cent of absences, no rigid rules of attendance, and consequently an ever-shifting audience for the instructor. The best method of obtaining good attendance in evening classes is through trade agreements with unions and employers which bring forces to bear upon the apprentice that he cannot well afford to affront. Where he is allowed certain credit in

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money or on apprenticeship service for his time in the evening classes, he is pretty likely to give good attendance. Compulsory attendance by State law is resorted to in some instances and may be worked out to give very beneficial results. A substantial fee may be charged on registering and returned to those having seventy-five per cent attendance, or all credit toward a night-school certificate may be dependent upon a fixed minimum attendance record. Attendance in all coöperative schemes of education is a factor that needs more consideration than it has heretofore received, and we have already, under "Trade agreements," mentioned some ways in which the employer and trade union may help in the matter.

WHERE SHALL THE INSTRUCTION BE GIVEN?

Having determined when the instruction in both skill and technical information is to be given, the authorities laying out the course must determine next where this instruction is to be given.

In a special building

Where skill alone is required and can be given with an inexpensive equipment in some building set aside for it, it might better be done in this way. Most of the skill needed for pattern-

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making and bricklaying and the advanced work in printing can be given in this way. It is very difficult to give this skill during the regular day's work.

In the plant during special hours

If the equipment is large and expensive, such as manufacturing machinery, an arrangement should be made to use the machinery in the plant itself out of working hours, the cost being assumed by the community. It is to be understood, of course, that the skill referred to here is not the general skill that comes through daily practice in the routine of the trade, but special skill which can be acquired much more quickly by specific instruction and practice, skill that is difficult for the apprentice to pick up in the shop, or that involves in the learning process a waste of material, the skill that helps the beginner over his stumbling-blocks. It is the "quality" of skill, the "quantity" being left to the commercial practices.

Within and without the plant

Where both skill and technical knowledge are required, an arrangement might well be made to give the former in the shop or factory, under a

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competent instructor working in specific time set aside from the regular working day, while the latter would be given in evening classes meeting in some public school. The illustrations already given, chemical processes, wall-paper designing, gunsmithing, electrical and stationary engineering, machinists, optical workers, and scores of other highly skilled trades, require skill and technical knowledge, and the equipment for acquiring skill is too large and expensive to be duplicated in the ordinary trade school. In such cases the apprentice should be paid for the time given to instruction in the shop.

Reorganization within the plant

Under certain conditions this shop instruction can be given to apprentices during working hours and in connection with regular productive labor, instead of using the plant out of working hours in time specifically set aside for instruction. In such a case the authorities in charge of the instruction must insist upon a reorganization of the apprenticeship work in the factory to coöperate with the organization of the trade school. Under an arrangement of this kind, the theory of wall-paper design would be taught in a class meeting for instruction purposes only, while the same appren-

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tices would acquire drawing technique during their regular daily work of tracing, coloring, enlarging and modifying the designs of others. Chemical and metallurgical processes, complementary drawing and mathematics for skilled trades like gunsmithing, tool- and cutter-making, etc., would form the basis of class instruction, the skill being given in a reorganized apprenticeship instruction upon the shop floor. Certain parts of the technical work, which would be classified under Mr. O'Leary's head of "trade knowledge," might be more readily taught in the shop, in conjunction with skill, than in the classroom and would be so arranged. There would also be cases where the more formal technical information would need to be taught in the shop, as the theory and practice of indexing on a miller, but it would be done in time specifically set aside for the instructor's use, and not, like skill, in the daily routine of work.

Master of apprentices

That part of the factory work which is to provide the skill must be under the direction of a competent master of apprentices, who shall be responsible for their training in skill, so that it will not be left to the haphazard attention of the

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foreman or superintendent. Mr. Magnus Alexander, of the General Electric Company in Lynn, Massachusetts, was especially designated by that company to direct the work of its apprentices. The Atchison, Topeka & Santa Fé Railroad employs a master of apprentices, who, with the aid of numerous assistants, directs the beginner's training throughout the entire system. The master workman holding such a position must lay out the processes to be taught in a definite and systematic plan, rotate his apprentices so that each one will pass through the series of processes, give such assistance as is needed, keep an individual record of the accomplishment of each apprentice, and keep in touch with the classroom work, if there is any.

Dangers to be avoided

The danger of this system is the exploitation of the boy. When he works in regular hours at regular work, the tendency to keep him on one job which he is doing well and rapidly is well-nigh irresistible. When properly done, this method of rotation at regular work will give even better results than segregative instruction in all the lower grades of skill and in most of the higher grades, excepting only such high-grade work as requires

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the constant attention of one instructor and where the processes of production are slow and expensive, like steel engraving and high-grade optical work. The employer will benefit materially by all this instructing of apprentices; I believe thoroughly in the system commonly used in Europe, where the apprentice attends school about ten hours a week, four on his employer's time and six on his own time.

Wherever a community feels that it is advisable to do some of the instructing in the daytime on the employer's time, the employer should willingly coöperate, but if he refuses, a law compelling him to allow such instruction would be justifiable. On the other hand, the instruction so given must bear directly upon his work: namby-pamby courses, general education, etc., ought not to be provided at the expense of an employer.

ART IN INDUSTRY

This subject is so closely related to courses of study that must be pursued in training for the advanced positions of many of the well-organized and highly skilled trades, and lends itself so readily to formal instruction in any type of trade school, that it has been found inadvisable to re-

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late it specifically to any of the foregoing topics. It well deserves a title of its own.

Whoever is planning any of the courses of instruction heretofore referred to must give careful consideration to the place in the course that shall be assigned to instruction in the theory and practical application of the principles of art, taste, and design required for perfection in the trade. Some idea of the wide application of such training may be had from a glance at the following list of occupations in the city of Minneapolis which have deserved a study especially from the standpoint of the art involved:—

Agricultural implements, artificial stone, automobiles, baskets, boots, shoes, brass and bronze products, brick and tiles, boxes, paper, fancy goods, rattan, willow split, bicycles, department and retail store purchase and display, architects, advertisers, carpenters, painters, interior decorators, paper hangers, and many others.

To determine exactly what place art shall have in the outline of work and the exact nature of the instruction to be given, we must again resort to an investigation of the trade itself.

What positions are there where the employees can exercise taste? What training are they receiving in this direction? Do they succeed in

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getting all the training needed under present conditions? Is there a demand by the consumer for improvement in the appearance of the product? Could a training be given to those seeking the positions listed above that would enable them to satisfy this demand? Exactly what should this training be? Should it accent color, form, finish, or quality, — all of them, or which of them? Is design, original or adapted, an important factor? Where the trade involves distributing rather than producing, it is desirable to know whether color, harmony, line, textures, proportions, and the acquisition of a convincing vocabulary along these lines will prove desirable. Take, for instance, the making of book-covers, carpets and rugs, cut-glass, draperies, embroidery, furniture, jewelry, millinery, ribbons, toys and notions, — the art for production is not the same as that needed for distribution. Design, originality, a mastery of color harmony, a knowledge of the relationship of the design to the actual process of manufacture, and the demand of the consumer are necessary for production. To sell these wares requires no special ability in design, a good knowledge of color harmony, no knowledge of the principles of manufacture, but a close touch with the demand of the consumer. It demands a

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training in taste, proportion, finish, quality, an ability to read human nature, and a vocabulary sufficient to cover any emergency. Which of these can and should be provided for?

It is not the business of the trade school to train the general consumer in the artistic appreciation necessary for intelligent consumption, — that is, for the purchase and use of such articles as pictures, clothing, furniture, carpets, and other furnishings of like nature, — except as an incidental education that must come along with preparation for vocational efficiency. Such training as a major part of the work belongs to practical arts courses in general education, in public schools, in art schools, and in the various institutes.

With a clear understanding of the foregoing principles and a careful investigation of each trade or occupation to determine its exact opportunities and requirements, the place of art in industry should be readily determined for each course of study projected.

UNORGANIZED OR LOW-SKILLED TRADES

We shall next consider an industry that has not sufficient outlook in advanced processes to warrant an extended training in part-time or evening

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classes, but in which limited but rather prompt advancement can be expected through training in short-unit courses. We may again refer to paper-box making, fifteen per cent of which is too difficult to be picked up on the shop floor; to special hand laundry work, machine-tending, of a somewhat advanced type, such as paper-cutting and folding apparatus, which must be adjusted for each job, and the more advanced units of such highly specialized industries as shoe-making and automobile manufacturing.

Short-unit courses

The short-unit course has been devised especially to meet these conditions. It is provided to meet the needs of people who want only a limited amount of instruction, who must have immediate help, and who are not as a rule expected to continue a long and systematic course of instruction for high-skilled positions. The short-unit courses should be laid out as a series of distinct problems, five or ten at the most, each one complete in itself with all its correlated work. The pupil on entering should know exactly what his first problem is. It should include the ability to do quickly and well some one thing needed for a step forward in his commercial work. It should not be some par-

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tial process, fundamental principle, or general rule; it should be a specific, concrete job, to be done, with or without the "why," as the case may be.

Thus, in the paper-box class the lesson might hinge upon the figuring-out of the amount of stock needed to fill an exact copy of an order taken from the books of the company, or it might refer to so simple a process as the holding of a box and applying the paper jacket where this is not done by automatic machinery; the first laundry lesson would teach the proper method of ironing one garment; a machine-tender would be shown the safest and most rapid method of setting up and feeding one machine; and so on through the entire list. The pupil should go away from his first lesson realizing what he has learned and wishing he had known it before. When the first problem is completed, he should have the feeling of having definitely finished one useful thing.

Series of courses

It is better to have a series of short courses, each of five or ten problems, and register for each course, than to lay out a long series of lessons based upon fundamental processes to be mastered

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first and applied later on. The maker of a short-unit course should work like a clipping editor by stepping into the industry itself and cutting out step after step for his course from the most important of the actual jobs which he finds are necessary for advancement.

Training for allied industries

Let us next take up an industry that in itself offers little advancement, but has several allied industries that afford rather attractive fields. Upholstering and leather-working, drop-forging of steel axles, making rubber tires, and painting and decorating have been mentioned already as offering better fields of advancement than those found in the central assembling factory of many automobile and carriage firms.

If one or more of these fields are worthy of regular trade training in skill or technical information, we have already covered the ground with our discussion of part-time and evening classes. If each allied trade, too simple for extended training, can be covered by short-unit courses, we have again touched upon every phase of this work, excepting one, the possibility of grouping these allied industries for the purpose of instruction.

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Allied groups

After laying out a definite course in each allied trade, compare these courses and determine whether there are technical principles and general information that form the underlying basis of a group of these trades, and if so, form combined classes in these subjects. This is much more likely to be true of a series of simple allied trades or divisions of work grouped around one central industry than it is of a number of separate industries not so related. It must not be confused with the "common content" idea, which proposes to relate a group of diversified, high-skilled trades through general principles that underlie the group. The relationship here is specific and is based upon a comparison of the courses actually laid out for each division. There are several distinct trades or branches of the industry connected with the making of yarn; the same is true of the leather industries, of furniture-making, and of paper-making. Many of these divisions are simple enough for short-unit courses and are really allied trades. A fund of general information about the central industry runs through each allied trade, and general technical principles will be found that are necessary to each division.

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These should be carefully sifted out and combined classes formed for their presentation.

If the same kind and degree of skill are needed, but with different applications, give this skill first. This would be the case, for instance, in bleaching and dyeing. Wherever possible, group these allied trades or divisions, give principles and manipulation common to the group, and specialize afterward in a short-unit course for each division. This not only saves time and expense, except where there are a large number of beginners for every allied trade, but allows a selection of occupation after some experience, gives a firmer foundation, makes it easier to take up another trade in case of economic necessity, and broadens the scope of a beginner's vision as he looks over the industrial field.

FITTING FOR A NEW OCCUPATION

When the problem is to take men and women who are working in one industry and put them in a trade school, in order to fit them for another industry that demands adult labor, or offers no opportunity for young beginners to enter the industry as apprentices or otherwise, the treatment is radically different.

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Related to apprentice's work

There is just a possibility that there may be points of likeness and contact between the industries in which the children are working and those which are demanding adults, but this is very unlikely. If such a point of contact can be found for any two of the industries, it should be used as the connecting link between that which the children are doing and the work they will be expected to do, and the course of study in our trade school should begin by exemplifying this relationship and building upon it as a foundation. The presence or absence of such points of contact may also be used in determining the advisability of attempting to fit for certain industries in the State, where the beginners must come from minors already employed in other lines of work.

There is no such thing as a young boy serving an apprenticeship as a chauffeur; the trade itself is not skilled enough to warrant years of apprenticeship, and the laws in most States and employers in all States forbid young boys the opportunity of learning in actual practice. The chauffeur's trade, however, is a very good trade, and a city might be justified in taking young men in shops and factories, where they are familiar with ma-

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chinery and the use of tools, and training them, in courses of short-unit type, to fill positions as chauffeurs. The same city might refuse to train grocer's clerks, bookkeepers, and errand boys for the chauffeur's trade, on the ground that the total lack of connection between their work in and out of school would necessitate a much longer and more expensive training than the city would be justified in giving for so simple a trade.

Not related to student's present work

In most cases there will be an abrupt line of separation between the two lines of work. It must now be remembered that the pupils in our trade school are to be dependent upon the school alone for their success. There will be no coördination or coöperation between the school and their daily experiences, nor will there be a background of skill or technical atmosphere to draw upon during instruction. This is a more difficult case than any we have considered before. In the short time allotted to evening work, we must give all the skill, all the special information, and all the atmosphere that is needed for a new trade. The curriculum in this case must be absolutely determined by the needs of the new job. It must not give an unessential thing, and, since time is so

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valuable, it should be planned step by step to the very end before the first lesson is given, so that if it exceeds the allotted time, it may be rearranged according to the trade value of each division. It cannot give technical information and leave skill to the daily practice in the shop; it cannot give the most essential points in skill and leave the little ones to come by practice; it must give every detail of skill and technical knowledge that it expects to make use of at any time in the entire course. It should plan for visits to the industry, in small groups, and covering one phase at each visit. There should be talks, pictures, exhibits given by experts in the industry, to produce the right atmosphere and to correct any false environment that might exist in the old industry which claims their daily labors. The instructors here should be experts in the industry studied. Finally, the time allowed must be greater than in previous cases.

With these restrictions I believe this work can be done successfully.

WOMAN'S WORK

Up to this point the principal emphasis has been put upon the work for men, but along with this problem of taking men from one industry

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and fitting them for another comes this much broader but much simpler problem of fitting women for the home while they are at work in some gainful occupation that offers no future. Even if it does offer a future, the majority of these women and girls will at some time be homemakers. If they leave productive labor and occupy themselves exclusively in the home, this becomes their occupation in life and demands a fit training; if they remain in industry and also keep up a home, as thousands do, there is all the more need for the most scientific and concise training to provide direct and economical methods, short cuts, time-saving appliances, and healthful, wholesome, and attractive ideas for eating, sleeping, and living. Moreover, the blind-alley and short-term occupations are filled with women and girls, the shift in personnel of employees is kaleidoscopic, and every normal woman has some ideal of her own home. This question has been written upon and spoken about so constantly that it will be useless for me to present further arguments.

Home-making

Training as housewives should be given. It should comprise sewing, undergarment making,

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making of children's clothing, mending and making-over garments, and simple dressmaking. Every article should be practical, complete, and ready to wear when accepted. Directly correlated with the above should be enough elementary textiles to determine the nature, quality, and reasonable cost of the most common dress goods, with simple tests for wool, cotton, linen, etc., and enough laundry to give the methods of washing different materials and colors; soaps, simple dyeing, and bleaching.

It should comprise cooking, a purely manipulative course, telling what to cook and how to cook it, the selection of meats and vegetables from economic and dietary standpoints, children's foods, some simple invalid dietaries and home tests for determining the purity of food-stuffs, freshness of eggs, and similar points.

It should comprise home science: ventilation with window boards and cotton screens; care of fires; sanitation of sinks, traps, cupboards, etc.; some few lessons on common bacteria, with detection and prevention; lighting, with cost of same; personal hygiene; and the science of home accounting, with the value of cost-keeping, weighing and measuring, and buying in bulk. I presume the expert domestic-science teacher will

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say that much is left out of the above and the uninformed will maintain that all this can be learned in the home; but to the first I answer that these women want definite daily problems only, stripped of all theory excepting the simplest and that most easily applied; and to the second I say, simply, visit their homes.

Woman's trade training

In respect to the regular trade training of women to earn a livelihood, I should not wish, because of the emphasis previously laid upon man's work, to appear unmindful or inappreciative of the immediate and growing need for investigation into all women-employing industries, as such, whether men are also employed or not.

In the vast department-store industry and with all retail firms lies a most promising field. Not only are employers willing and anxious to coöperate in any school for salesgirls, but the minimum-wage law, now coming into operation in our States, will make such instruction indispensable to the girl herself. When the minimum wage of a sales position is automatically raised from \$6 to \$9, for instance, the firm will at once comply and pay the \$9, but they will not pay it to a \$6 girl. The employee must earn \$9, or give

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way to some one else, perhaps from some other city or State, who can earn the minimum allowed by law. The \$6 girl has only two alternatives, increase her earning capacity or get out. The demand for trades courses in the art of selling, conducted by the community, assisted by the mercantile firms, taught by experienced salesmen and saleswomen who have also been trained in the art of instructing, will be felt immediately in every State where the minimum wage is adopted.

The same will be true of like classes in all lines of wage-earning occupations for women.

TRAINING IN GENERAL EFFICIENCY

Up to this time we have held ourselves consistently to a discussion of courses of study intimately connected with the work which the pupils are doing in the trades or with the work of some industry into which they are expected to go. A great danger lies in the tendency of professional teachers to drift away from the immediate issue and actual concrete problems because of their own training and their own ability to evaluate mediate interests. The employee and his employer have no such ability, taken in the large, and the time and intellectual equipment at the

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disposal of the trade teacher forbids this ideal method of treatment.

This does not mean, however, that we are to make human machines of our pupils. There are many other things that can be given besides skill and technical knowledge which will be a distinct benefit to the young worker in his trade. Thus, his own physical condition is of the utmost importance, as are the habits that improve or retard it.

Accuracy, care, forethought, method, and the habit of thinking about his work, the work of others, and possible improvements are indispensable to a mechanic's preferment; but a preachment on alcohol, a course in ethics, and training in the psychological processes of thought will accomplish nothing. These subjects are not to be written into the course of study of the pupil, but into that of his teacher. They are to be absorbed, to be acquired as habits are acquired by imitation and the influence of environment set up by his instructor. You cannot teach cleanliness to a group of boys when their instructor is spitting tobacco juice into a sawdust pile, or exhort them into systematic methods when they are searching all over the shop or tool room to find some misplaced tool or piece of stock. These things, to-

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gether with thoughtfulness for fellow workmen, duties to one's employer as regards wasted time or material, and the other personal traits that make a man popular with his fellows and valuable to his superiors, must be soaked in, daily, almost unconsciously, because of the persistent forethought and example of the instructor, and because the pupil, in following this example and actually putting its principles into practice, makes them a component part of his shop experience rather than of his course of instruction.

General education in trade schools

And now arises the oft-mooted question, Shall we teach some general education in our industrial schools?

So far as I can see, this question resolves itself into a simple analysis of the needs of the minors under consideration and into the question of whose business it is to supply these needs. The all-day industrial school, as indicated before, either completes the general education or builds upon it and extends it to provide the means of advanced training. It must give general education, of course, and, wherever it draws public funds, it should be compelled to train for citizenship.

For the part-time school, the evening classes,

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and short-unit courses, the first matter to be considered is, Are they supported by public funds? If they are not supported by public funds, the question of general education must be left to the authorities conducting the school. If they are wholly or in part supported by the public, then the public has a right to demand that training for good citizenship be given in all these classes; but in my judgment it is inadvisable, from a practical standpoint, ever to enforce this right in the case of short-unit courses; and it is foolish to force it upon the other classes until a careful investigation has shown that proper training in this subject has not been given and cannot be given in the public schools.

Civic training

By civic training in this instance is meant specific classroom instruction in the duties of citizenship, not the thousand and one little sidelights on good citizenship that are intimately connected with industrial life and may be emphasized by a good shop teacher many times in the course of a year. Unquestionably the apprentice should be trained in citizenship; but it may be better for the State to improve this training in the common schools and restrict the entrance

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into publicly supported part-time and evening schools until after such training has been received.

Formal civic training may be impossible at the early age at which the apprentices leave the common school; it may be impossible to interest them in civic ideas divorced from their industrial ideas, but if it is possible to give it in connection with the general education, it is much better there than as a part of the industrial course. Our experience has shown that the apprentices, in evening classes, at least, have no more interest in civic training and are no more adapted to it than the children of the upper grammar grades. The burden of proof should rest with those who desire to add civic training to the industrial course.

At all events, no training of a general nature, civic or otherwise, unless it is absolutely needed for the trade work, should be given in time paid for by the employer unless he consents to the same. When he pays the taxes of his local schools, he is providing his share of the expense of the general educational training of the community.

This will not operate as a hindrance in case of the half-time system and such coöperative systems, where the employer agrees to pay a certain fixed wage for the pupil's entire time, half to be

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spent in his shop and half in the school. The wage scale is fixed according to the specific agreement, and the success of the plan requires an entire agreement between the school and the employers, not only regarding the courses to be given in the school, but also regarding the jobs to be given in the shops.

The particular danger lies in empowering a community to take apprentices out of a shop or factory for certain hours a week, compelling the employer to pay the same wage as before, and then using this time for general education or civic training. Such a course, although justified where the training given on the employer's time is strictly trade training which the apprentice needs for advancement and is not getting in the shop, cannot be justified where the training is not related to his shop work and consequently does not offer his employer any return for the time he is compelled to pay for. If the employer agrees, there can be no legal objection.

Regarding general education other than civic, every State should have a minimum general education without which no normal child should be permitted to leave the public school except under special provision for continuation work. Where the pupils of an industrial part-time and evening

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school can be shown to have passed this minimum educational requirement, the public should not have authority to force general education in these schools. Where the pupils have not completed this minimum requirement, the school would be a continuation school and would be compelled to offer general work enough to complete the minimum course. Short-unit courses should never be continuation courses, but they might be included as a distinct unit in the work of a continuation school.

General education needed for industrial efficiency

Nothing in the above should be construed to indicate that industrial school authorities are not to be permitted to offer general education whenever such courses are deemed advisable for the advancement of their pupils in the industry. Under such circumstances the authorities must again investigate the industry in the training for which they propose to include this general education.

What is the average schooling of the beginner now going into the industry? Is the industrial progress hampered most by lack of trade training, lack of brains, or lack of general education?

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Recall again the car-heating engineer, who stated that his beginners were hampered very largely for lack of general training, and not for want of specific trade instruction. Would this general training have been given in the public schools or was there sufficient schooling and too little application? Is more common schooling needed? How much more? Can it be given better before entering the trade or after entrance, when it comes along with the practical application? The investigator here must be careful to distinguish between an apparent and a real need for more general education. Apprentices often appear lacking in common-school subjects when in fact they are lacking in the ability to apply what they know in those subjects to the concrete problems at hand. They appear to lack general education; what they really need is specific and special courses training them to use what they already know. It is doubtful, for instance, if short courses in plane geometry, solid geometry, elementary physics, etc., given in the usual way, would be of much service in assisting an apprentice to figure out the cutting speed on a lathe, the amount of material wasted, or the weight of a casting made from a pattern, although these results depend upon principles in the subjects named. A thorough sixth-grade

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course in denominate numbers would supply all the general education really needed, —not all that would be desirable, but all that would be absolutely essential; and the rest is to be specific application to concrete problems.

If the general schooling needed is considerably above the minimum requirement of the State, would it pay these beginners to enter a regular school and obtain it there? What is the average education of the students in the trade class? What are their financial conditions? The answers to these questions, and similar ones that will suggest themselves, should determine in the minds of the trade-school authorities how much or how little general education to include in the work. Wherever possible, general schooling should be approached through its practical adaptation to the trade and not as a disjuncted subject. As has been so ably pointed out by Professor Richards, where little skill and little or no technical knowledge are required by any line of employment that offers fair places as a return for experience alone, it usually indicates the need of general continuation school instruction rather than trade training; and where skill and technical knowledge are requisite to advancement, it usually indicates the need of special training following all the

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general schooling required to profit by such training.

Moral and recreational subjects

It remains only to say a few words regarding one type of general education that will prove of tremendous value to a State or Nation in promoting the happiness and welfare of its people. The industrial revolution of the last thirty years, with its increasing subdivision of labor, its multiplication of processes, and the invention of semi- and wholly automatic machinery, has brought forth hundreds of thousands of jobs that not only are entirely lacking in all stimulus to physical and mental growth, but are actually deadening to mind and body by their monotony. Whenever States, cities, corporations, or citizens can do anything to alleviate this condition, they are morally bound to do it. Reading courses, music and applied art, lectures, entertainments, the public schools open in the evenings for concerts and dancing, athletics, gymnasium work, playgrounds and recreation-center classes, anything that will prove successful in a community, meet the approval of its people, and offer relief from that monotony of existence which is driving men to the saloons and gambling-tables and women

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to the dance-halls and cafés, should be provided.

But we must temper our sentiment with sense; we must see clearly just what end these courses are to achieve, and, working for that end, divorce them from all pretense of industrial and trade training, all relation to our practical instruction for shop and factory, — the one having to do with the hours of labor and the other with the hours of leisure.

As there is a time for work and a time for play, so there is a time for work training and a time for instruction in the wise use of leisure; but in neither case will it prove successful to attempt both lines at the same time.

IV

SELECTING THE TEACHER

THE IMPORTANCE OF THE TEACHER

THE longer I live and the more I come in contact with teachers and pupils in every type of school, both in this country and in Europe, the more I appreciate the value of the teacher as the one indispensable factor in any system of education. It is to me a matter of both wonder and regret, when I am shown over some magnificent building, expensively furnished, the heating, lighting, and ventilation in charge of a licensed engineer, magnificent machinery and shop equipment comprising every possible type of tool and machine, and then find the instruction being given by mechanics who have never had even an elementary course in the mechanics of teaching, never made out a practical course of study, never prepared a month's work in advance, and are unable to keep even moderately good order in their classes. Or, still worse, to find some underpaid and overworked regular school teacher, who has had a six weeks' summer course in preparation for indus-

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trial work or has taken a manual-training course two hours a week for the year, put over industrial or apprenticeship classes that require mechanical skill, shop knowledge, an appreciation of industry from the inside, and experience as a worker in the trade under instruction.

The standard

Let us first set standards for our various teachers, find what it will cost to hire teachers that reach these standards or as nearly reach them as can any one to be procured for that work, set aside this cost, and then use what remains of our appropriation to provide the place and the equipment. Nine times out of ten a \$2500 teacher with an \$800 equipment will turn out superior work to that of an \$800 teacher with a \$2500 equipment. The former will find a way to provide the tools in some shop or factory, but the latter cannot find a way to provide additional personality and mental power.

The first step in selection

First of all, then, what sort of teachers do we need, where are they to be found? If we must train them, how and by whom shall it be done?

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THE EXPERIENCE OF GERMANY

I will refer you first to the experience of Germany in regard to the sort of teachers that have proved most successful.

Directors

There are ten directors in the ten evening trade schools of Hamburg held in public school buildings; five of them are principals of the same buildings in the daytime, three hold advanced licenses as instructors in higher schools, while two are teachers in the common schools. Of the four day trade schools housed in one main building given up exclusively to trade instruction, not one has a director who is primarily a school man; all have directors who are engineers, experts in the trades taught, but especially trained for directing school activities. The trade schools run under the directions of trade unions all have tradesmen as directors. The work of the day school is distinctly higher in type than the work of the night schools.

It would appear, then, that for the higher and more technical day school an engineer or expert tradesman is selected as director and is obliged to take training in school direction, whereas for the less technical night-school work, a school

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principal or teacher is preferred. It is to be remembered that all these evening schools are under the direction of one inspector, who is a rather high type of educator and business organizer, and who is in no way connected with the common-school system of the city. The management of the system is separated from that of the common-school system, but the direction of each evening school is placed in the hands of a regular teacher responsible to this special trade-school inspector.

Teachers

Of the 223 teachers employed in the ten evening schools, 45 are tradesmen, 5 rectors of day schools, 9 teachers in high schools, and 164 are common-school teachers. Thus, in the evening school, where nearly all theory is taught, the practical work being done in the commercial shops during the day, 178 school teachers are employed as against 45 tradesmen. Of these 178 school teachers, only 3 are giving any work in the nature of shop instruction, while of the 45 mechanics, 7 are engaged in classes of pure theory and 38 in shop work or on shop problems.

In general we may say that in all these trade schools the professional teacher is employed to

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impart theory and as far as possible for elementary technical work, the actual shop instruction, the advanced technical work, and certain classes in advanced theory being left to the mechanic. In every instance, however, the professional teacher has taken a course in practical training for the trade he is to teach and the tradesman has finished a course in pedagogy. In no case has the mechanic stepped directly from his shop, or the teacher from his classroom, into the trade school without special preparation.

Summary

Looking back over these statements they may be summed up as follows: Where the facility in imparting information and the preservation of interest and discipline are most important and the technical knowledge is simple enough to be acquired by study, the professional teacher is selected; where the skill, knowledge of the trade, and technical information are more important than the method of presenting them, the mechanic is selected.

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TRAINING FOR THE AMERICAN TEACHER

Principles of teaching

First and foremost in the American trade school we must require of every teacher a training in the mechanics of teaching. This may be anything from a carefully planned course in some educational institution to frequent short talks between a rural-school superintendent or principal and his one industrial teacher concerning the outlining of a course, the instruction by demonstration and individual help, proper methods of examination, and the principles of discipline. It should not be a study of formal pedagogy, but a study of practical trade teaching; and no one should be permitted to teach without it.

Trade knowledge

Secondly, we must demand a rather intimate knowledge of the trade to be taught, whether gained through actual experience as a worker in the trade or through special training in the principles of the trade given in specially organized courses for that purpose. Thus the trade worker would present his experience as a mechanic and his training in the principles of teaching before being employed as a shop instructor or teacher of

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the higher classes in technical knowledge. The professional teacher would present evidence of special training in courses given for apprentices in the trade, or in special courses fitting teachers to instruct in this trade, and also from visits, study, and, if possible, some weeks' actual work in the trade, before he is hired to teach the classroom work and elementary theory of that industry. Under such an arrangement the drawing and shop mathematics of the mechanic and building trades, the chemistry of textiles, dyeing and bleaching, the composition and spelling of the printing trade might be given by these professional teachers; the shop practice, design and final estimating, the advanced processes of the textile industry, and the actual designing and printing being left to expert tradesmen.

My own experience has shown that there are more school men who can acquire the elementary trade principles than there are mechanics who can become proficient in the art of teaching; also, that it is easier to teach the school man than the mechanic. It has also proved that in many cases the school man with some trade training gives better satisfaction in the classroom not in the shop than the mechanic with some pedagogy; but wherever I have found a mechanic who did master the

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principles of teaching he has proved to be the most valuable man in the entire group.

The community's part

For this reason a State or community that proposes to offer trade instruction should provide opportunity for its tradesmen to receive training in the art of teaching and should seek diligently for those who prove to be natural instructors; and it should provide at the same time classes, visits, excursions, lectures, and short terms of practical work in various trades, where the common-school teachers may acquire sufficient technical knowledge to do the elementary classroom work of the trades.

The danger is, however, that for financial or other reasons the community will seek to employ these professional teachers in giving the actual trade training. In such cases the element of atmosphere, and all that it stands for, is lacking. It is like a picture or a play; it only represents real life. Even though the professional teacher has gone into the industry and learned it, if he was a teacher when he did so he never got the viewpoint of the apprentice and journeyman who lived in that trade, by that trade, and never expected to work in any other trade. Let the school

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man give such related classroom work as he can do best; but place the high-grade mechanic or trade worker in charge of all work that must be an exact duplicate of the work done commercially. I have seen a school teacher train a class in the names of various cuts of meat, their appearance, cost, food-value, waste, etc., and do it more successfully than any butcher in the city could have done it; but I never yet saw a school teacher who could pick up a knife and equal a butcher in instructing that class how to cut up a carcass.

DETAILS OF A TEACHERS' TRAINING COURSE FOR THE MECHANIC

How shall the State provide these various opportunities for training?

Mechanics of teaching

The easiest to provide from the point of equipment and the most difficult from all other stand-points is the mechanics training in pedagogy. Any public-school building will serve as the place; the work should be given in the evening during the winter months and should require not less than eighty to one hundred evenings of actual attendance. We have found it satisfactory to run

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twenty-five weeks, two evenings per week, turning out a class every other spring, but this is largely a matter for decision in each individual case.

The class of mechanics should be restricted in number and very carefully selected. Each applicant should bring a record of his service as apprentice and journeyman, a recommendation in writing from his present employer, and should make application in person to the man directing the work. Those who for any reason are deemed unfit to enter the class should be rejected. Into this question enters a consideration of personal appearance and manner, conversational ability, hopes and ambitions and reasons for entering the class, age, experience, and any other points that indicate the probability of success or failure. The most promising applicants up to the limited number prescribed should be selected, and if there still remain some, not undesirable candidates, a few of them should be held as alternates.

From this it can be seen that the man in charge of the organization of this class must be an expert. He should understand men, be familiar with the principles of teaching, have a general knowledge of the trades to be covered, and understand thoroughly the running of a trade school. Preferably he should be the principal of a trade or

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vocational school, a director of industrial work in city schools, or at least a teacher of long experience in industrial or trade teaching. He must understand what type of mechanics make the best trade teachers and how to select that type.

Probation period

Having selected the class, a probation period of two or three weeks should be allowed for voluntary or compulsory dropping out and replacing from the alternate list. After this period expires, the regular registration should be made and a substantial financial fee collected from each man or woman, the same to be retained or returned under certain attendance restrictions as decided upon by the authorities in charge. Experience has shown that people value most what they are willing to pay for, and the most valuable people are always willing to pay. This is simply our final sift in the sifting process. We are now prepared to discuss what these mechanics shall be taught.

Since the mechanics of teaching is the one subject required of all and the one which by its nature admits of presentation to mixed groups of trade workers, I am including a suggestive outline giving in a concrete way what this subject ought to cover.

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Outline of work

With but slight variation the following plan can be adapted to training teachers for a large variety of trade work: —

1. Industrial education.
 - What it means.
 - Why it has arisen.
 - Present needs.
 - Future possibilities.
2. Industrial schools.
 - Various kinds — name, nature, aim, and province of each.
 - Comparison with manual training.
3. Value of an outline.
 - First sketch.
 - Rearrangement in specific order.
4. Course of study.
 - Relation to equipment.
 - Definite aim.
 - How much skill?
 - What processes? Jobs?
 - Allied subjects.
5. Special points on adapting outlines to trade work.
6. Equipment.
 - Relation to work planned.
 - Bids — specifications.
 - Firms — general cost.
 - Arrangement in shop or work room.
 - Individual or general tools.

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7. The shop exercise.
 - Definite idea.
 - Previous preparation.
 - Readiness of tools and materials.
 - Clear instruction.
 - Demonstration or individual work.
8. Recitation and examination.
 - Proper questioning.
 - Trade standards for judgment.
 - Trade terms.
 - Interest — memory — judgment.
 - Rating shop work and exercises.
 - The practical examination marking.
 - Self-checking for the teachers.
9. Discipline.
 - Direct — disorder, loafing, absence, tardiness.
 - Shop ideals and class spirit.
 - Indirect — system (tool room, stock room).
 - Self control (between students).
 - Value of time and material.
 - Work ideals — social justice.
10. Records.
 - Efficiency cards — general cards.
 - Judging students.
 - Time cards and job tickets.
 - Want book — efficiency records of tools and materials.
 - Bills.

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11. Materials and products.
 - Purchase: In bulk?
 - As needed?
 - Disposal.
 - Selling product.
 - Giving to student.
 - Building for school or system.
 - Contract work.
 - Student compensation.
12. Place of industries in modern education.
13. Relation of trade unions to trade education.
14. Health — industrial hygiene and safety.
15. State laws — rules — regulations and financial assistance.
16. Differences between trade and industrial instruction on one hand and regular school teaching on the other hand.
 - Economic — social.
 - Individual — discipline.
 - Age — environment.
 - Earning capacity — scholarship.

Method of preparing the outline

In preparing an outline of this kind, if there are already successful schools established in the industries for which these people are training, find out what the directors of those schools consider most important for their instructors to know, what mistakes and weaknesses are most

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common among beginning teachers. and such practical first-hand information. and then provide in your course for discussions of these points. I use the word "discussions" advisedly. These practical people cannot at first enter intelligently into a discussion of the matter contained in this outline. Some considerable time must be devoted by their teacher to talks and comments, largely by himself alone. References to books, pamphlets, magazines, bulletins, etc., should be carefully selected and assigned to prepare a background for discussion. The more important topics should be run through and commented upon, and as soon as the class has a fund of information from which to draw discussion, this method should be adopted. The instructor in mechanics of teaching should be the director of the industrial work or present credentials of efficiency equal to those mentioned for the one selecting the class.

Drawing, mathematics, and other subjects

If the trades included in this training class for teachers are the regular manufacturing and building trades dependent upon drawing and applied mathematics, these subjects should be required of every man who cannot show evidence of proficiency in rapidly applying them to the work of

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his trade. The relationship between the drawing, mathematics, and the shop work should be emphasized. Where drawing and mathematics do not enter into the trades, but elementary chemistry, geology, metallurgy, or some other science does, that science should be required under the same conditions as given for drawing. Four years of experience in training mechanics for industrial teaching has shown us the necessity and importance of providing for a considerable amount of additional training in drawing, mathematics, and science, all three bearing directly upon the trades work. We have been unable to depend upon the previous knowledge regarding these subjects of even our highest-grade mechanics, although in some cases it was necessary only to review work which they had once had to reorganize it under fundamental principles so as to apply it intelligently to trade teaching. To be able to use applied mathematics in a shop and to be able to explain the how and the why of this use to an apprentice are very different things, so our mechanics find.

Shop practice

The actual shop practice of these prospective teachers should be divided into two parts —

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(1) training in any process of the industry, any machines in the industry, or any work in their particular branch of industry in which they are not already proficient; and (2) practice teaching. We have had high-skilled machinists, drawing from \$1300 to \$1450 a year, who knew practically nothing about the universal milling machine or the universal grinder. Pattern-makers, who had worked so many years in one factory that they were doubtful regarding the best methods of constructing patterns of an entirely different nature, have also registered in the class. It has been found advisable to provide some opportunity for additional shop work for these men, although it has never needed to be extensive and has usually been but a small part of the entire training. The men themselves are depended upon to suggest during conferences the nature of the shop work in which they are weak and for which they feel a need of supplementary training.

Practice teaching

The practice teaching is absolutely essential to the proper training of the mechanic for school positions. It should be given under conditions as nearly as possible like those the mechanic will meet in his first school job. It should be super-

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vised, discussed, subjected to all the tests of discipline and system that occur in the regular trade school, and must be given to fair-sized groups of young men or women actually at work in the trade. The latter may be provided by forming classes of apprentices under the direction of regular instructors, and detailing the men or women from the teachers' class to instruct these apprentices for a certain number of nights under supervision. After the close of the first series of practice lessons, a short time may well intervene for discussions, visits to other classes, and preparation for further teaching, after which the prospective teacher is again placed in charge of a class and given more responsibility and authority.

Where the community has not the mill, factory, or shop equipment to carry on this work, an arrangement can nearly always be made with a technical high school, college, factory, shop, or mill, that has the desired equipment, for use of the same outside of regular working hours, and subject to the supervision of some employee of the firm who is compensated by the community. The rental in such case is often less than the interest on such an equipment as the municipality would need to provide.

By varying these suggestions to meet the local

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needs and by selecting trades which are prominent in the community and which can be properly provided for both in equipment and number of apprentice classes, any locality can offer a very satisfactory opportunity for its mechanical experts to acquire proficiency as teachers.

TRAINING THE PROFESSIONAL TEACHER IN TRADE SUBJECTS

In order to train the professional school teacher to handle trade subjects a more elaborate system of equipment is necessary, but the actual instruction is more easily provided.

Theory

So far as theory is concerned, these teachers need only the general principles underlying trade education. This may be given them in a series of lectures and discussions conducted in a classroom by the director or head teacher in the industrial system, but this is to be recommended only where there are no schools in operation. Where there are evening trade schools, the entire group of teachers registered should be taken by the director on a series of visits to the various schools. The work in each school or class should be explained, the aims, results, and methods used to

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attain these results, the peculiar problems and difficulties of each trade teacher, discipline, and all such matters that go to make successful trade instruction should be pointed out and made note of. These should later be discussed and examined, and the members of the class should furnish proof to the instructor that they have obtained the proper point of view.

Trade principles and skill

These teachers must also be given an elementary but thorough training in the principles of the trade, the classroom work of which they are to teach. It is not sufficient for them to know this classroom work itself, but they must also know something of the hand work that goes with it, the shop conditions, the gradations of work as apprentices advance, if they are to obtain the best results in their teaching.

The actual classroom work may be given them by some instructor at that time engaged in doing that work, or by some experienced trade teacher who has studied out and prepared a proper course of study which will form a basis for a beginning. The drawing, mathematics, science, English, business practice and system, civic training, and all such allied work can always be

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arranged for without difficulty. Competent men in the trade can be found to instruct the teachers' class in these matters, and only men in the trade itself should be selected for this work. It is important that these teachers get the work entirely from the tradesman's standpoint, and that it shall relate immediately and always to the practical use in the trade; the method and felicity of imparting the knowledge in these cases is of secondary importance. The class brings these latter qualities from its professional work.

That part of the classroom teacher's training that depends on pure skill can be given in any shop or workroom containing the requisite apparatus; therefore, if there are any educational institutions, public or private, in the vicinity, that possess such an equipment, arrangements should be made to give this training in skill in the regular classes of that school, or to use its equipment and possibly its instructors or director in special evening instruction.

If the equipment is inexpensive, or one that is portable and not likely to be injured, it may often be borrowed from some industrial concern, used for a certain number of weeks, and then returned to the owners. Such equipments as samples of wools, cloths, leather, patterns, designs, and

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innumerable others that any one can suggest, are readily borrowed for use in evening-school instruction. Where the equipment will serve for many classes and be a permanent asset, it can be purchased; but this is inadvisable in industries with a constantly changing product.

Industrial appreciation

Even more important than the training in skill is the training in industrial appreciation, which is acquired only through contact with the industry itself. The community may provide for this training in three different ways.

The simplest and least expensive is to arrange, with the different industrial concerns whose work is to be taught, for the entrance, as actual beginners in the industry during the summer vacation, of such regular school teachers as desire to equip themselves for teaching the classroom work of that particular trade. The compensation will be that regularly allowed for beginners, supplemented or not by the community as may be decided upon. This method has the advantage of allowing a large number of people to obtain this experience.

The second method is to arrange for work on Saturdays and such fixed holidays as are allowed

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the schools and not the shops, during the entire time the schools are in session. This is much more difficult to arrange because of the intermittence of employment, half-holidays, and general attitude of employers to consider it a nuisance. The teachers, however, work without compensation as a rule, which aids in securing the job. It is often possible to arrange so that the work of a school teacher will come entirely in the forenoon, and the afternoons, or some of them, can be devoted to shop work.

The third, best, and most expensive plan is for the community to select, from those completing the work of the teachers' class, one or two of the most promising and arrange for them to spend the next half-year in the industry, drawing the same salaries they receive when teaching, less the amount earned in the shop. These men or women would then become the supervisors of the classroom work done by those who were trained as suggested in the first or second way and would also teach in the trade classes in the evening. They would form the selected group from which to pick teachers for all-day schools and for part-time instruction in trade work.

Under this arrangement a city might, for instance, have a group of fifty or sixty public-

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school teachers taking the work in trade-teaching methods, visits to classes, etc. This would be divided into several smaller groups studying the drawing, mathematics, chemistry, English, and other allied subjects decided upon as necessary for the beginning apprentice, the work being given in a classroom by an expert. These same groups, some of them combined when possible, would be taken into some shop or work room and given the elementary principles and skill of the trade itself, and from time to time certain members would be relieved from their other work and detailed to give class instruction to groups of apprentices formed from the various trades. At the close of the course, these second groups of teachers would be again divided into classes of strictly one trade or part of a trade and then assigned for summer work in the industries. At the close of the summer, two or three picked men, selected for their efficiency in teaching classroom subjects and for their work in the trade, would be continued in the commercial shops or factories at the expense of the community.

The whole remaining list of satisfactory graduates would then be made up into an eligible list, from which the director of evening trades schools would select his classroom teachers. From those

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who obtained satisfactory experience in this work, and also from the specially selected two or three previously chosen, the day trade schools would select their classroom instructors. Any city that follows this plan, modified to meet its conditions, will secure good trade-school instruction.

It will be contended that the expense of this training will be considerable, but it will not exceed the expense now met without complaint in supporting our normal schools, training schools, training classes, and educational departments in State universities, whose purpose it is to turn out capable teachers for the public schools.

Trade training will never reach a very high degree of efficiency so long as mechanics, neither trained nor specially selected, are chosen as our instructors; public-school teachers, unfamiliar with trade conditions, have charge of our classrooms, and political appointees have direction of the community's industrial educational system.

CONCLUSION

In the foregoing pages an effort has been made to point out first of all a general line of study to be applied to the various industrial activities of a State in order to determine whether or not pub-

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licly supported trade education should be given. Where an affirmative answer resulted from the above, suggestions were given regarding the nature and types of trade training to be established. General rules for determining the courses of study were presented, and in some cases more detailed suggestions were given as concrete examples of what such courses should be like. Lastly, the selection and training of teachers for these trade schools was treated as fully as it is practicable to handle a subject that must needs be modified continually to meet local necessities.

It is perfectly well known to the author that all this is suggestive rather than final, and that many minor and concrete branches of the subject have been merely touched upon or omitted altogether; but it is believed that what has been said is entirely sufficient to form a working basis for any community to start with. So far as the details of education are concerned, the results of experience in each community are the only safe milestones of advancement.

Without a doubt these schools will be a permanent and ever-increasing benefit to the children of industry. They will be a benefit to the employer and to every citizen who hires the services or purchases the output of skilled mechanics. It

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still remains to be determined just how great the advantage is to the employer, in order to arrive at an equable proportion of the paid working time that may be demanded for trade instruction.

It will also be interesting to observe whether they advance the interests of the trade unions or not. If the unions continue to work for quantity of numbers, irrespective of skill, it is doubtful if the industrial schools will have other than little effect on their strength. If, however, the unions seek to increase their influence through the excellence of their membership and the quality of work the union members are able to produce, these industrial schools will prove a powerful factor in advancing the reputation of the unions.

We are not, however, concerned directly with these problems, but indirectly with all of them. We are concerned in working out some common ground of mutual advantage, so definite and plain that the State, the employer, and the union will join hands for a common cause, the uplifting of the children of labor, and through them, of labor itself.

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